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USER'S MANUAL(U) ARMY ENGINEER WATERWAYS EXPERIMENT
STATION VICKSBURG MS GEOTECHNICAL LAB E V EDRIS ET AL.
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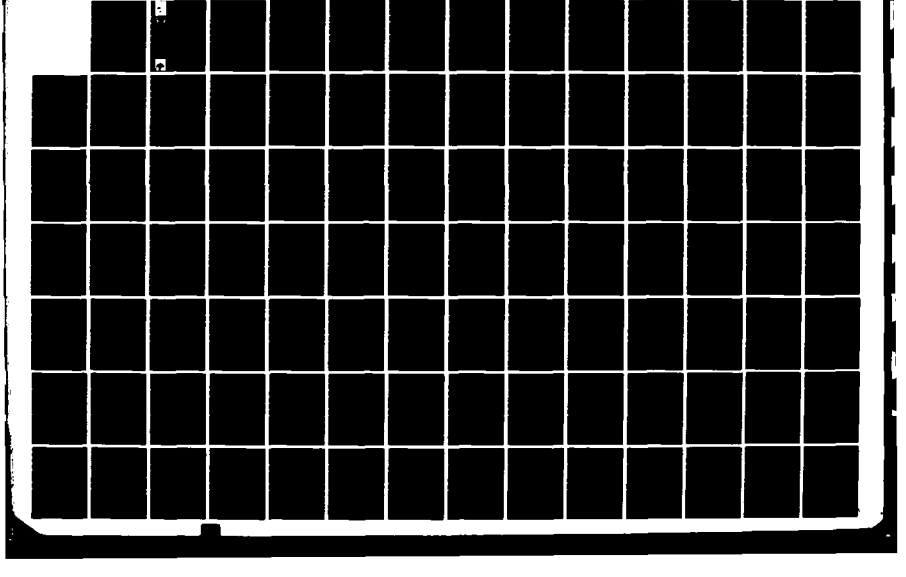

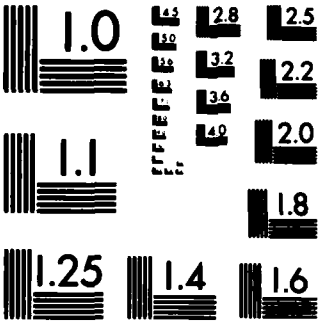

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

US Army Corps of Engineers

GEOTECHNICAL LABORATORY

INSTRUCTION REPORT GL-83-1

GEOTECHNICAL CONSTRUCTION CONTROL DATA BASE SYSTEM: USER'S MANUAL

by

Earl V. Edris, Jr., David P. Hammer
Wipawi Vanadit-Ellis

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A report under the Computer Applications in Geotechnical Engineering (CAGE) Project

April 1983
Final Report

Prepared for Office, Chief of Engineers, U. S. Army
Washington, D. C. 20314

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20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

A data base system for storage, retrieval, and display of geotechnical construction control earthwork data for earth and rock-fill dams is described and detailed instructions for using the system are given with examples for actual projects. The data system is designed for field project quality control and quality assurance monitoring and rapid display of a variety of construction control data and preparation of reports required by Corps of Engineers (CE) guidance (EM 1110-2-1911, "Construction Control for Earth and ~~(Continued)~~

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Unclassified

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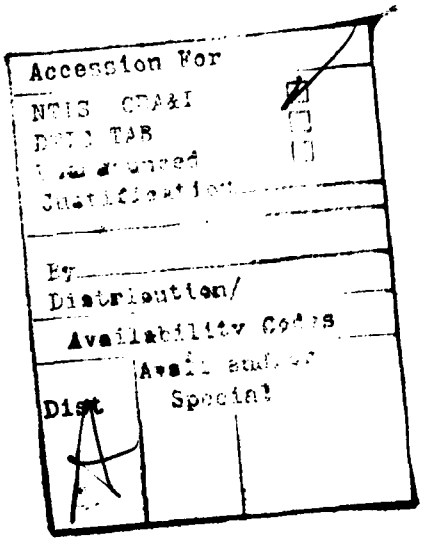
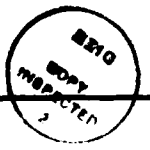
20.. ABSTRACT (Continued).

Rock-Fill Dams"). The system provides for easy, interactive data entry and editing with automatic data checks and user specified threshold values that produce warning messages when data exceeds the range of field compaction control criteria. Data storage and retrieval are accomplished using the CE owned SYSTEM 200 Data Base Management System on the Corps-wide Teleprocessing Procurement Service (TPS) operated (1983) by Boeing Computer Services (BCS). The data entry and retrieval programs developed for the data system are designed for a low skill level and minimum training of field project personnel.





PREFACE

This user's manual describes the use of a data base system for geotechnical construction control of earth and rock-fill dam embankments. The system is a product of the Computer Applications in Geotechnical Engineering (CAGE) Project of the Office, Chief of Engineers, U. S. Army.

Mr. David P. Hammer, Soil Mechanics Division (SMD), Geotechnical Laboratory (GL), U. S. Army Engineer Waterways Experiment Station (WES) (now with the Ohio River Division) provided overall direction in developing the system and led the system development team. The data base design and software were developed jointly by Mr. Earl V. Edris, Jr., SMD, GL, WES, project engineer for the system and Dr. Darrell L. Ward, Computer Science Department, North Texas State University. The initial application of the system was sponsored by the San Francisco District on Warm Springs Dam, Calif., and personnel of that project office provided user application needs and developed report-writing programs for the system. Another application that resulted in generalizing of some software was sponsored by the Savannah District on Richard B. Russell Dam, Ga. Mr. Edris prepared the report. The introduction was furnished by Mr. Hammer. Mrs. Wipawi Vanadit-Ellis made several additions and revisions and completed the Appendices. Mr. Hammer was the CAGE Project Investigator until November 1980, when Mr. William E. Strohm, Jr., Engineering Geology and Rock Mechanics Division (EGRMD), GL, WES, became Project Investigator. Mr. Jack Pickett (DAEN-CWE-BA) provided valuable review comments.

Criteria for the Geotechnical Construction Control Data System was developed by the CAGE Quality Assurance (QA) Task Group composed of Messrs. Hammer and Edris with assistance from personnel of the South Pacific Division, San Francisco District, and Warm Springs Dam Project Office, Savannah District and Richard B. Russell Dam Project Office.

Since November 1980, CAGE project work has been directed by a Management Group composed of the following: Mr. Paul Fisher, Chief, Geology Section, Geotechnical Branch (GTB), OCE (DAEN-CWE-SG), Chairman; Mr. Richard Davidson, Chief, Soil Mechanics Section, GTB, OCE

(DAEN-CWE-SS); Mr. Richard Malm, Chief, Computation and Analysis Section, General Engineering Branch, OCE (DAEN-CWE-BA); Mr. Samuel Gillespie, Engineer, Civil and Environmental Engineering Branch, OCE (DAEN-MPE-D); Mr. Leroy McAnear, Chief, SMD, WES Program Manager, CW R&D Program, Materials - Soils; Dr. Don Banks, Chief, EGRMD, WES Program Manager, CW R&D Program, Materials - Rock; Mr. William E. Strohm, Jr., Principal Investigator, CAGE. This investigation was carried out under the general supervision of Dr. William F. Marcuson III, Chief, Geotechnical Laboratory.

Commanders and Directors of WES during development of this data system and publication of this user's manual were COL Nelson P. Conover, CE, and COL Tilford C. Creel, CE. Technical Director of WES was Mr. Fred R. Brown.

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CONVERSION FACTORS, INCH-POUND TO METRIC (SI) UNITS OF MEASUREMENT

Inch-pound units of measurement used in this manual can be converted to metric (SI) units as follows:

Multiply	By	To Obtain
cubic yards	0.7645549	cubic metres
feet	0.3048	metres
inches	2.54	centimetres
miles (U. S. statute)	1.609347	kilometres
pounds (force) per square inch	6.894757	kilopascals
pounds (mass) per cubic foot	16.01846	kilograms per cubic metre
square inches	6.4516	square centimetres

GEOTECHNICAL CONSTRUCTION CONTROL DATA BASE SYSTEM: USER'S MANUAL

PART I: INTRODUCTION

Purpose

1. This report is intended to provide a description of and instructions for use of the geotechnical construction control data base system developed by the Computer Applications in Geotechnical Engineering (CAGE) project for and in conjunction with the U. S. Army Engineer District, San Francisco. The report is written for the general user and is not intended to replace the computer operating system and data base user's manual.

Basic Definitions

2. A data base can be defined as pieces or groups of data stored together in an orderly form such that access to all or any part of the data can be readily accomplished. Data manually stored in a filing cabinet could be classified as a simple form of a data base. A computerized data base is one that utilizes a computer and associated hardware for data entry, storage, and access. A data base system includes, in addition to the data base itself, all peripheral software that enables the data not only to be quickly and orderly stored, but accessed in any form desired and manipulated or analyzed by whatever means most useful to the user. A data base system can therefore be categorized as an engineering tool. It can, if properly utilized, be a powerful tool that greatly enhances the usefulness and value of the data.

3. More specifically, an earthwork construction control data base system is a computerized system that provides for the orderly storage, retrieval, and analysis of data resulting from testing performed during construction of an earth and/or rock-fill embankment. Since the purpose

of this testing is to monitor the quality of construction and provide as-built documentation, proper use of the data base system described herein can allow for the accomplishment of these features in a more effective manner than heretofore possible. Also, use of this type of data base system can also be very helpful in several phases of contract administration.

Background

4. The need for the use of data base systems in geotechnical engineering was identified by Hammer and Bennett (1979). The specific application of a data base system for construction control data was also identified but not as the highest priority. However, the application proceeded ahead of some higher priority items when a request for development of such an application for use during construction of Warm Springs Dam was made to the WES by the U. S. Army Engineer District, San Francisco, through the South Pacific Division office.

5. Warm Springs Dam is an approximately 300-ft*-high zoned earth-fill dam located at the confluence of Warm Springs and Dry Creeks about 80 miles north of San Francisco, Calif. It contains in excess of 30 million cubic yards of compacted earth-rock materials. The design called for an average of 95 percent of the modified compaction effort (ASTM D 1557-78, Method D) (from American Society for Testing and Materials (ASTM) 1981) to be obtained within a specified water content range of 1 percent dry to 2 percent wet of optimum water content. Placement rates were to be upwards of 100,000 cubic yards of compacted material per day (two shifts). The majority of materials to be used consisted of clayey gravels and gravelly clays, materials that are excellent from the standpoint of engineering properties but very difficult to control with respect to desired percent compaction and specified water content. Therefore, a large volume of compaction control data would be generated

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* A table of factors for converting inch-pound units of measurement to metric (SI) units is presented on page 4.

during construction and time was of the essence in developing the data and reporting the results.

6. Accordingly, the San Francisco District with encouragement from the South Pacific Division entered into an agreement with the U. S. Army Engineer Waterways Experiment Station (WES) under the CACE program to develop a geotechnical construction control data base system for use at the Warm Springs Project.

7. Work on the data base was initiated in December 1979 and the system was up and running by the spring of 1980. While in use during the 1980 construction season the system was further debugged and was improved considerably. By the end of the 1980 season the system was 98 percent stabilized and being used extensively.

Applications

8. By providing virtually instant recall and analysis capability with output in any desired format, the system can be useful in providing the following applications during project construction:

a. More effective daily control of desired percent compaction and specification requirements such as placement water content and material suitability.

b. Constant monitoring of the construction control system itself (i.e., monitoring of methods used in determining maximum dry density and optimum water content, rapid water content and gradations, rock corrections, field test locations and frequency, etc.).

c. Generation of Eng Form 4080, "Summary of Field Compaction Control Data" and associated forms.

d. Providing assistance in the solution of problems that develop during construction relating to compactive effort, density, water content, and material type, source, and quantity.

e. Providing assistance in working out day-to-day problems and misunderstandings with the contractor.

f. Providing the designer with instant access to the latest data whenever the need arises.

9. In addition to the foregoing, the system can be an invaluable aid and labor-saving device during preparation of the Criteria and Performance Report and in defending contractor claims during and subsequent to project construction. The system can also be of service to the analysis and solution of certain problems that may develop during project operation.

System Requirements

10. In order to use this data base system, the project must have a means of accessing the programs which currently (1983) reside on the Boeing Computer Service (BCS) mainframe computer system. All U. S. Army Corps of Engineer districts have access to this computer system through the Corps-wide Teleprocessor Services Program (TSP). To access the computer service, the project office needs to have use of a time-sharing terminal with the necessary equipment to transmit data over the telephone lines. The type of terminal determines the amount and means of entering, retrieving, and displaying data. A minimum terminal would be one with the capability of getting a hard or paper copy. Most data output is set up for use on a 132-character printer which is the minimum equipment needed for the various graphic programs. However, a graphic terminal would enable the user to obtain a better quality of graphic plots. The increasing availability and low cost of microcomputers increases the possibilities for the project to become semi-independent of the large computers. Terminals need a relatively clean (dust-free) environment, which could be a problem for the project office.

11. The number of people trained to use this data base system is determined by the project size and testing frequency. Generally, one or two project personnel are needed to enter and retrieve data. In addition, there needs to be one responsible individual, usually the embankment engineer, who knows what to do with the data. Training project personnel to use the data base system, usually a three-day process, is accomplished by CAGE project personnel who will visit the project site.

12. To implement the geotechnical construction control data base, the project or district personnel need to contact the CAGE project personnel at WES. A meeting will be arranged to discuss details of the system in meeting project needs (projects have different types of data, operating procedures, and objectives). If there are no major changes or reprogramming, the CAGE personnel will set up the data base, other associated programming similar to the type presented in this report, along with training at very little cost to the project or district.

13. The project cost to use the data base system will depend upon usage of the system, how much data is entered, and how much the project uses the system for data retrieval. The costs for the various examples in Parts III and IV are shown to provide an indication of the total operating costs.

Other Applications

14. After the initial system was developed for Warm Springs Dam, three other projects contacted CAGE to implement a data base system. The variations in operating procedure and programs to meet these project needs are included in Parts III and IV. The first additional request was made by Savannah District for use at Richard B. Russell Dam. A different data entry procedure was developed (Example 3) along with modifying some of the output programs. The next two requests were from the U. S. Army Engineer District, Los Angeles, for use with their projects in the Phoenix, Ariz., area (Adobe Dam and Skunk Creek project). Adobe Dam is an identical duplicate of the Warm Springs system, while the Skunk Creek system contains some minor data element changes.

Report Organization

15. The remainder of this report is broken into three parts or modules. Part II describes the data base structure and lists the various data elements. Part III explains the various procedures to enter data to the system. Part IV describes all the methods to obtain data

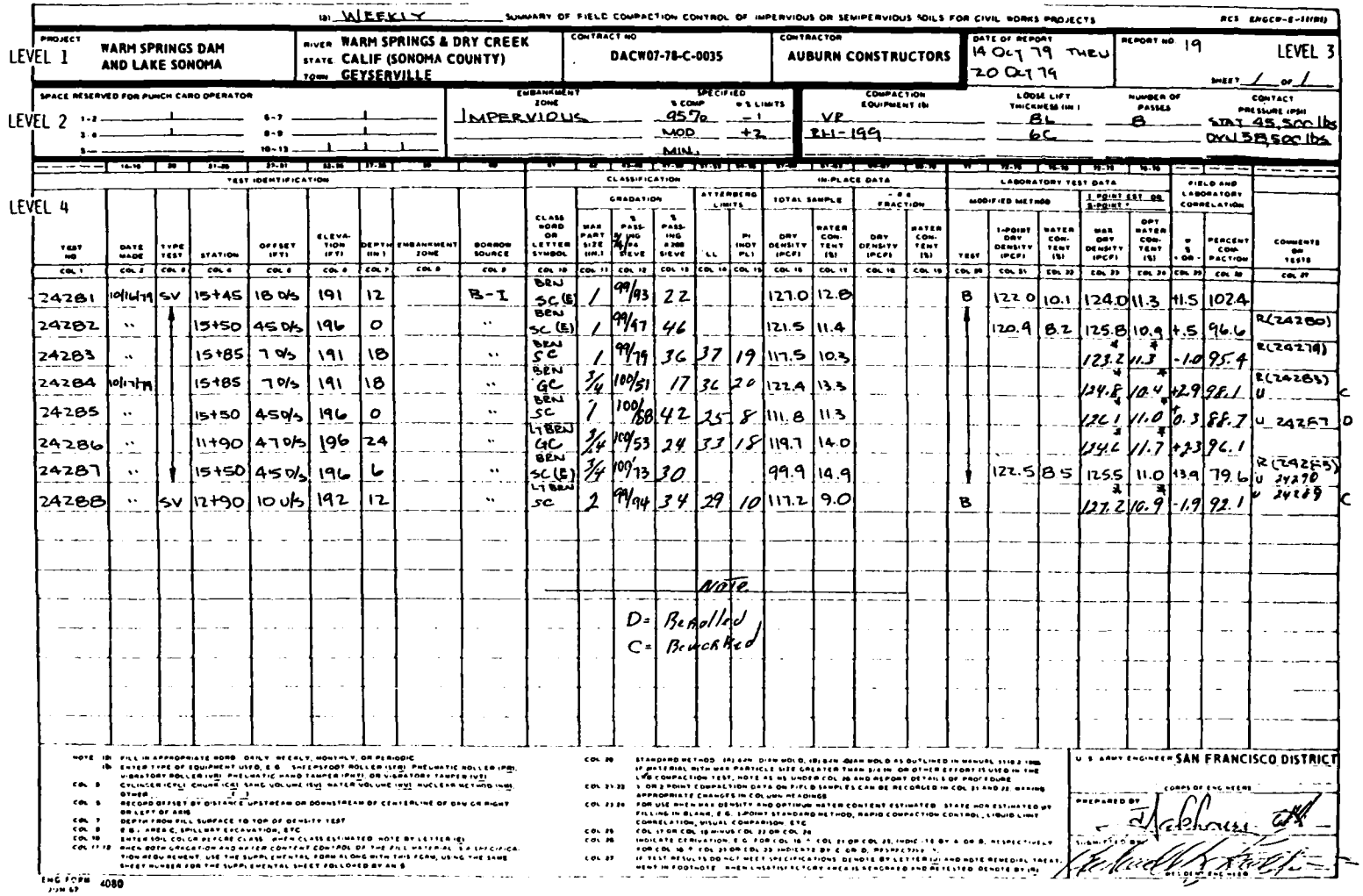
from the system. Detailed examples, illustrating all the procedures, are described in Parts III and IV.

PART II: STORAGE MODULE

Data Base Structure

16. The construction control data base management system uses System 2000 (trademark of Intel Systems Corporation) as the storage device. This data base is a hierarchy or tree-type of system where data are grouped into functional units at each level and each level has a direct relationship to the data appearing above and below that level. This storage system was chosen because it closely models the project record-keeping system and because it was available to all CE Districts.

17. The project embankment engineer is required to submit a summary of field compaction control data on Eng Form 4080 or 4081 to the district office at a preset time interval. Form 4080, shown in Figure 1, is used for all materials except granular material that requires a relative density for which Form 4081 (as shown in Figure 2) is used. By looking at how the forms are organized, the user can begin to comprehend the structure of the system. The project information at the top of the form, identified as level 1 in Figures 1 and 2, will remain unchanged throughout the project. Different zones of a dam may not be included on the same report; therefore the first level or branch for the project is the embankment zones. The data identified as level 2 in Figures 1 and 2, located on the left side of the second line, are the same for all reports on a zone. As stated earlier, results for each zone must be reported to the districts at prearranged intervals. Thus to simplify the record keeping, report periods are set up to correspond to these intervals. For Warm Springs Dam, these reports are required weekly; whereas at Richard B. Russell Dam the reports are submitted monthly. Each report is designed to allow the district office to have all the information necessary to evaluate the construction process. Therefore, the information identified as level 3 in Figures 1 or 2, the right end of the first two lines, includes the data that pertains to the report and can be changed for each report interval. During each reporting period, a number of density and associated tests are performed. The



(D) WEEKLY — SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS ENGCW-E-11(R8)

LEVEL 1

PROJECT	RIVER	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO
WARM SPRINGS DAM AND LAKE SONOMA	WARM SPRINGS & DRY CREEK	DACW07-78-C-0035	AUBURN CONSTRUCTORS	14 Oct 79 THRU 20 Oct 79	19
	STATE CALIF (SONOMA COUNTY)				LEVEL 3
	TOWN GEYSERVILLE				SHEET 1 OF 1

LEVEL 2

SPACE RESERVED FOR PUNCH CARD OPERATOR (1-2, 3-4, 5-6, 7-8, 9-10, 11-13)

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED % LIMITS	COMPACTION EQUIPMENT (5)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
IMPERVIOUS	95%	-1	VR	8L	8	STAT 45,500 lbs
	MOD	+2	RH-199	6C		DYN 38,500 lbs
	MIN.					

LEVEL 4

TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS. GROUP OR LETTER SYMBOL	GRADATION: MAX. PART SIZE (IN.)	GRADATION: % PASSING ¾" SIEVE	GRADATION: % PASSING #200 SIEVE	ATTERBERG LIMITS: LL	ATTERBERG LIMITS: PI (NOT PL)	IN-PLACE DATA: TOTAL SAMPLE: DRY DENSITY (PCF)	IN-PLACE DATA: TOTAL SAMPLE: WATER CONTENT (%)	IN-PLACE DATA: -#4 FRACTION: DRY DENSITY (PCF)	IN-PLACE DATA: -#4 FRACTION: WATER CONTENT (%)	LAB TEST: MODIFIED METHOD: TEST	LAB TEST: MODIFIED METHOD: 1-POINT DRY DENSITY (PCF)	LAB TEST: MODIFIED METHOD: WATER CONTENT (%)	LAB TEST: 1 POINT SET OR 3-POINT: MAX DRY DENSITY (PCF)	LAB TEST: 1 POINT SET OR 3-POINT: OPT WATER CONTENT (%)	FIELD AND LABORATORY CORRELATION: % -#4 + OR -	FIELD AND LABORATORY CORRELATION: PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
24281	10/4/79	SV	15+45	18 D/S	191	12		B-I	BRN SC(E)	1	99/93	22			127.0	12.8			B	122.0	10.1	124.0	11.3	+1.5	102.4	
24282	"		15+50	45 D/S	196	0		"	BRN SC (E)	1	99/97	46			121.5	11.4				120.9	8.2	125.8	10.9	+.5	96.6	R(24280)
24283	"		15+85	7 D/S	191	18		"	BRN SC	1	99/79	36	37	19	117.5	10.3						123.2	11.3	-1.0	95.4	R(24278)
24284	10/4/79		15+85	7 D/S	191	18		"	BRN GC	3/4	100/51	17	36	20	122.4	13.3						124.8	10.4	+2.9	98.1	R(24285) U C
24285	"		15+50	45 D/S	196	0		"	BRN SC	1	100/88	42	25	8	111.8	11.3						126.1	11.0	-0.3	88.7	U 24287 D
24286	"		11+90	47 D/S	196	24		"	BRN GC	3/4	100/53	24	33	18	119.7	14.0						124.2	11.7	+2.3	96.1	
24287	"		15+50	45 D/S	196	6		"	SC(E) LT BRN	3/4	100/73	30			99.9	14.9				122.5	8.5	125.5	11.0	+3.9	79.6	R(24285) U 24270
24288	"	SV	12+90	10 D/S	192	12		"	SC	2	99/94	34	29	10	117.2	9.0			B			127.2	10.9	-1.9	92.1	U 24289 C

NOTE

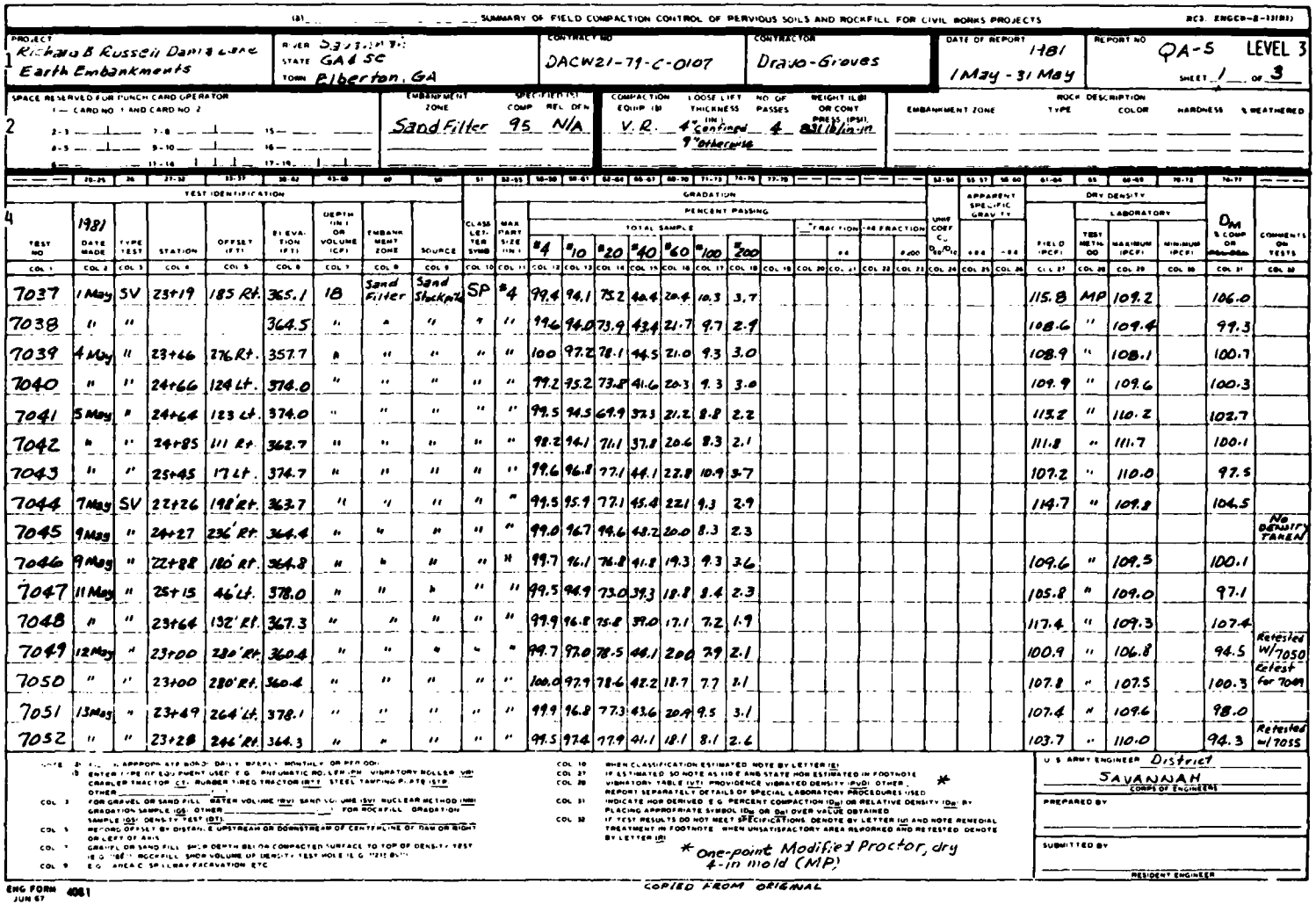
D = Rerolled
C = Bench Red

NOTE 1a: FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
1b: ENTER TYPE OF EQUIPMENT USED, E.G. SHEEPSFOOT ROLLER (SFR); PNEUMATIC ROLLER (PR); VIBRATORY ROLLER (VR); PNEUMATIC HAND TAMPER (PHT); OR VIBRATORY TAMPER (VT)
COL 3: CYLINDER (CYL); CHUNK (CK); SAND VOLUME (SV); WATER VOLUME (WV); NUCLEAR METHOD (NM); OTHER (O) — EXPLAIN
COL 5: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF ABUT.
COL 7: DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8: E.G., AREA C, SPILLWAY EXCAVATION, ETC.
COL 10: ENTER SOIL COLOR BEFORE CLASS. (WITH CLASS ESTIMATED. NOTE BY LETTER (E))
COL 11-12: WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20: STANDARD METHOD (A) 6-IN. DIA. MOLD, (B) 6-IN. DIAM. MOLD AS OUTLINED IN MANUAL 1110-2-1906 IF MATERIAL WITH MAX. PARTICLE SIZE GREATER THAN 3/4-IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS MS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21-22: 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24: FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL, LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC.
COL 25: COL 17 OR COL 18 MINUS COL 23 OR COL 24
COL 26: INDICATE DEVIATION, E.G. FOR (COL 18) + (COL 21 OR COL 22), INDICATE -1.0 BY A OR B, RESPECTIVELY FOR (COL 18) + (COL 21 OR COL 22), INDICATE BY C OR D, RESPECTIVELY.
COL 27: IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY TREATMENT IS REWORKED AND RETESTED, DENOTE BY (R)

U.S. ARMY ENGINEER SAN FRANCISCO DISTRICT
CORPS OF ENGINEERS
PREPARED BY
SIGNATURE OF DESIGNATED REPRESENTATIVE
OFFICE SYMBOL

ENG FORM 4080 JUN 69

Figure 1. Example of ENG FORM 4080 showing data base levels



SUMMARY OF FIELD COMPACTION CONTROL OF PERVIOUS SOILS AND ROCKFILL FOR CIVIL WORKS PROJECTS

ENG FORM 4081 JUN 67

PROJECT: Richard B Russell Dam & Lake, Earth Embankments
RIVER: Savannah
STATE: GA & SC
TOWN: Elberton, GA
CONTRACT NO: DACW21-79-C-0107
CONTRACTOR: Drago-Groves
DATE OF REPORT: 1981, 1 May - 31 May
REPORT NO: QA-5 LEVEL 3, SHEET 1 OF 3

LEVEL 1

LEVEL 2

EMBANKMENT ZONE	SPECIFICATION COMP	SPECIFICATION REL DEN	COMPACTION EQUIP ID	LOOSE LIFT THICKNESS (IN.)	NO OF PASSES	WEIGHT (LB) OR CONT PRESS (PSI)
Sand Filter	95	N/A	V.R.	4" confined, 9" otherwise	4	831 lb/in-in

LEVEL 4

TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.) OR VOLUME (CF)	EMBANKMENT ZONE	SOURCE	CLASSIFICATION SYMBOL	MAX PART SIZE (IN.)	GRADATION PERCENT PASSING TOTAL SAMPLE #4	#10	#20	#40	#60	#100	#200	UNIF COEF C_u	APPARENT SPECIFIC GRAVITY	FIELD (PCF)	DRY DENSITY LABORATORY TEST METHOD	LABORATORY MAXIMUM (PCF)	LABORATORY MINIMUM (PCF)	D_M % COMP OR	COMMENTS ON TESTS
7037	1 May	SV	23+19	185 Rt.	365.1	18	Sand Filter	Sand Stockpile	SP	#4	99.4	94.1	75.2	46.4	20.4	10.3	3.7			115.8	MP	109.2		106.0	
7038	"	"			364.5	"	"	"	"	"	99.6	94.0	73.9	43.4	21.7	9.7	2.9			108.6	"	109.4		99.3	
7039	4 May	"	23+66	276 Rt.	357.7	"	"	"	"	"	100	97.2	78.1	44.5	21.0	9.3	3.0			108.9	"	108.1		100.7	
7040	"	"	24+66	124 Lt.	374.0	"	"	"	"	"	99.2	95.2	73.8	41.6	20.3	9.3	3.0			109.9	"	109.6		100.3	
7041	5 May	"	24+64	123 Lt.	374.0	"	"	"	"	"	99.5	94.5	69.9	37.3	21.2	8.8	2.2			113.2	"	110.2		102.7	
7042	"	"	24+85	111 Rt.	362.7	"	"	"	"	"	98.2	94.1	71.1	37.8	20.6	8.3	2.1			111.8	"	111.7		100.1	
7043	"	"	25+45	17 Lt.	374.7	"	"	"	"	"	99.6	96.8	77.1	44.1	22.8	10.9	3.7			107.2	"	110.0		97.5	
7044	7 May	SV	22+26	198' Rt.	363.7	"	"	"	"	"	99.5	95.9	77.1	45.4	22.1	9.3	2.9			114.7	"	109.8		104.5	
7045	9 May	"	24+27	236' Rt.	364.4	"	"	"	"	"	99.0	96.7	79.6	48.2	20.0	8.3	2.3								No DENSITY TAKEN
7046	9 May	"	22+88	180' Rt.	364.8	"	"	"	"	"	99.7	96.1	76.8	41.8	19.3	9.3	3.6			109.6	"	109.5		100.1	
7047	11 May	"	25+15	46' Lt.	378.0	"	"	"	"	"	99.5	94.9	73.0	39.3	18.8	8.4	2.3			105.8	"	109.0		97.1	
7048	"	"	23+64	132' Rt.	367.3	"	"	"	"	"	99.9	96.8	75.8	39.0	17.1	7.2	1.9			117.4	"	109.3		107.4	
7049	12 May	"	23+00	280' Rt.	360.4	"	"	"	"	"	99.7	97.0	78.5	44.1	20.0	7.9	2.1			100.9	"	106.8		94.5	Retested w/7050
7050	"	"	23+00	280' Rt.	360.4	"	"	"	"	"	100.0	97.9	78.6	42.2	18.7	7.7	1.1			107.8	"	107.5		100.3	Retest for 7049
7051	13 May	"	23+49	264' Lt.	378.1	"	"	"	"	"	99.9	96.8	77.3	43.6	20.9	9.5	3.1			107.4	"	109.6		98.0	
7052	"	"	23+28	246' Rt.	364.3	"	"	"	"	"	99.5	97.4	77.9	41.1	18.1	8.1	2.6			103.7	"	110.0		94.3	Retested w/7055

COL 3: ENTER TYPE OF EQUIPMENT USED E.G. PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), CRAWLER TRACTOR (CT), RUBBER TIRED TRACTOR (RT), STEEL TAMPING PLATE (STP), OTHER (OT).
COL 5: FOR GRAVEL OR SAND FILL: WATER VOLUME (WV), SAND VOLUME (SV), NUCLEAR METHOD (NM), GRADATION SAMPLE (GS), OTHER (OT). FOR ROCKFILL: GRADATION SAMPLE (GS), DENSITY TEST (DT).
COL 6: RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS.
COL 7: GRAVEL OR SAND FILL: SHOW DEPTH BELOW COMPACTED SURFACE TO TOP OF DENSITY TEST (E.G. "18"). ROCKFILL: SHOW VOLUME OF DENSITY TEST HOLE (E.G. "215 CF").
COL 9: E.G. AREA C SPILLWAY EXCAVATION, ETC.
COL 10: WHEN CLASSIFICATION ESTIMATED, NOTE BY LETTER (E).
COL 27: IF ESTIMATED, SO NOTE AS (E) OR AND STATE HOW ESTIMATED IN FOOTNOTE. *
COL 28: VIBRATORY TABLE (VT), PROVIDENCE VIBRATED DENSITY (PVD), OTHER.
COL 31: REPORT SEPARATELY DETAILS OF SPECIAL LABORATORY PROCEDURES USED.
COL 32: IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (M) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA REPORTED AND RETESTED, DENOTE BY LETTER (R).

* One-point Modified Proctor, dry 4-in mold (MP)

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Figure 2. Example of ENG FORM 4081 showing data base levels

data necessary to complete level 4 of the forms in Figures 1 or 2 are required for each test. Sometimes the project will include some notes that pertain to one or several test results, as illustrated in Figure 1. These notes, referenced in the comment field, are associated with the report on which they occur. Thus both test results and notes are associated with a report interval.

18. A schematic of the basic data base structure, a four-level system modeled after Eng Form 4080, is shown in Figure 3. The top level is the project information about the dam. The first branch is the embankment zone information which contains general and specification-type of information that is unique to the particular zone, identified as level 2 in Figures 1 and 2. For each embankment zone there is a varying number of report periods or intervals. This information, shown as level 3 in Figures 1 and 2, consists of dates and type of equipment. The test data and notes, shown as level 4 in Figures 1 and 2, reside under the report period.

Definition of Data Elements

19. Within each repeating group or level of the data base, there are individual data elements which have names, abbreviations, component numbers, and other attributes identifying the type of data that will be retained. These other attributes of the data elements are an indication of how the data element is stored and used within the system, the data type, and the field size. Each data element is stored within the data base in one of two ways, depending on how the element will be used. If the data element is not to be used to define specific data groups, the element is designated as a NON-KEY element. However, if the data will be used to define specific groups of data for analysis, the element is designated as a KEY element. For example, the command "List embankment zone, comp-percent where test-type equals SV (sand volume)," will cause an error message "illegal use of a non-key element." Test-type is a NON-KEY element and should never be used as a specifier in a WHERE clause. "List embankment zone, comp-percent test-type where embankment

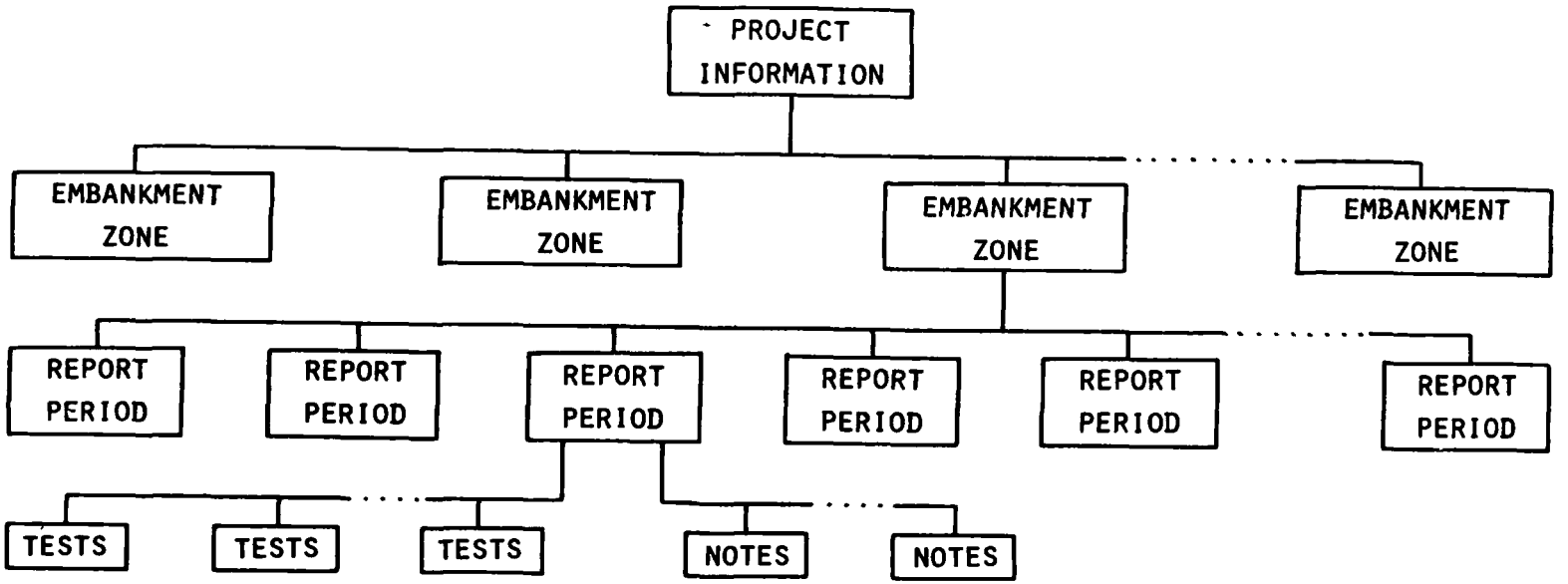


Figure 3. Schematic of data base structure

zone equals core;" is correct since embankment zone is a KEY element. All the data elements within the system fall within one of the following four types: NAME consists of any combination of letters or numbers and will be treated as text material; DATE consists of a fixed format for month, day, and year; of the two types of numeric data, DECIMAL allows a decimal point, whereas INTEGER does not. The field size is the maximum number of characters that can be stored for a particular element. The data elements and their attributes that are used for the system are listed in Table 1. A schematic of the data base structure using the component numbers from Table 1 is shown in Figure 4.

20. The data base structure can be modified for any particular specification required by other projects. Data elements can be added, deleted, rephrased or regrouped by redefining or rearranging the structure. As a minimum, the elements for Eng Form 4080 should not be removed because they are used in the established retrieval programs. Data elements that are invariable for one level can be moved up to the next level. As long as the component number and element name are not changed, any established retrieval program will work. Any changes to the data elements should occur when the data base is being built because the cost increases greatly to make changes after the data base is completed and in use.

21. To establish a new data base, users should evaluate their needs so that all necessary data elements are included in the system. This evaluation should include studying this manual and establishing communication with the appropriate personnel at WES, with other users, and with district and project personnel. Once the data elements are identified, the structure for a new data base can be set up. In addition to the data elements, other attributes must be selected. In particular, the KEY or NON-KEY designation should be well thought out because once the element is declared NON-KEY, the user cannot search the data or select data groups using that element as a qualifier. Later versions of System 2000 allow expensive NON-KEY searches. Data elements can be added, subtracted, or modified at an additional cost once the data base is established. Therefore the benefit of changing the element must be weighed against the additional cost.

Table 1

Definition of Data Elements

Component Number	Element Abbreviation	Element Description	KEY/NON-KEY Designation	Type of Data	Field Size
1	PROJ-NAME	Name of project	KEY	NAME	40 characters
2	PROJ-RIVER	Name of the river at the project location	NON-KEY	NAME	40 characters
3	PROJ-COUNTY	Name of the county where the project is located	NON-KEY	NAME	20 characters
4	PROJ-STATE	Name of the state where the project is located	NON-KEY	NAME	XX
5	PROJ-TOWN	Name of the town associated with the project	NON-KEY	NAME	20 characters
6	CONTRACT-NO.	Contract number	NON-KEY	NAME	16 characters
7	CONTRACTOR	Name of the contractor	NON-KEY	NAME	40 characters
20	ZONES	REPEATING GROUP FOR THE EMBANKMENT ZONES			
21	EMBANK-ZONE	Name of the embankment zone	KEY	NAME	12 characters
23	COMP-PERCENT	The minimum percent compaction for embankment zone (obtained from the specification)	KEY	DECIMAL	9999.99
25	TEST-TYPE	The type of test used to check the compaction effort, e.g., sand volume (SV)	NON-KEY	NAME	XXX
27	WL-LIMIT	The upper and lower bounds on the deviation from	KEY	INTEGER	99
29	WR-LIMIT	optimum water content (obtained from the specifications)	KEY	INTEGER	99
31	S-PLT200	The specification limit on the percent less than the #200 sieve	KEY	INTEGER	99
33	FMS	Field mold size in inches	NON-KEY	INTEGER	99
40	PERIOD	REPEATING GROUP FOR THE REPORT PERIODS			
41	BEGIN-DATE	The beginning date of the report	KEY	DATE	10 characters
42	END-DATE	The ending date of the report	KEY	DATE	10 characters
45	EQUIP	Type of equipment used during report	KEY	NAME	15 characters
47	LLT	Loose lift thickness	KEY	INTEGER	99
49	CMPT	Compacted lift thickness	KEY	INTEGER	99
51	PASSES	Number of passes	KEY	INTEGER	99
53	C-EFFORT	Type of compaction effort; i.e., standard (STD) or modified (MOD)	NON-KEY	NAME	XXX
55	REPORT-NO.	Report number	KEY	INTEGER	999

(Continued)

Table 1 (Continued)

Component Number	Element Abbreviation	Element Description	KEY/NON-KEY Designation	Type of Data	Field Size
60	TESTS	REPEATINC GROUP FOR THE TESTS			
61	NO.	Test number	KEY	INTEGER	9 characters
62	TC	Test complete, either Y or N	KEY	NAME	X
63	USE	Indicates if the test has been retested	KEY	NAME	X
65	DATE-MADE	Date of test	KEY	DATE	10 characters
66	LAB	Either QA or QC lab (A or C)	KEY	NAME	X
67	STA	Station	KEY	NAME	6 characters
69	OFT	Offset, + is upstream; - is downstream	KEY	INTEGER	5 characters
71	ELE	Elevation	KEY	DECIMAL	9999.9
73	DEP	Depth, in inches	KEY	INTEGER	99
75	MS	Material source	KEY	NAME	10 characters
76	FWD	Field wet density	KEY	DECIMAL	999.9
77	FDD	Final field dry density (using oven dry weight)	KEY	DECIMAL	999.9
79	FWC	Final field water content (using oven dry weight)	KEY	DECIMAL	99.9
81	QFDD	Quick field dry density	KEY	DECIMAL	999.9
83	QFWC	Quick field water content	KEY	DECIMAL	99.9
85	LMS	Laboratory mold size	KEY	INTEGER	99
87	DD1	One-point dry density	KEY	DECIMAL	999.9
89	WC1	One-point water content	KEY	DECIMAL	99.9
91	Q1DD	Quick one-point dry density	KEY	DECIMAL	999.9
93	Q1WC	Quick one-point water content	KEY	DECIMAL	99.9
95	DD2	Second-point dry density	KEY	DECIMAL	999.9
97	WC2	Second-point water content	KEY	DECIMAL	99.9
99	CT	Type of lab test that is compared with the field result, i.e., 1-pt or 5-pt*	KEY	INTEGER	9 characters
101	MDD1	Family of curve (FOC) maximum dry density	KEY	DECIMAL	999.9
103	OWC1	FOC optimum water content	KEY	DECIMAL	99.9
105	RCP	Rock correction factor (% greater than 3/4" sieve)	KEY	INTEGER	99
106	QRCP	Quick rock correction factor	KEY	INTEGER	99
107	FMDD	Final maximum dry density (for record, from 1-pt or 5-pt)*	KEY	DECIMAL	999.9
109	FOWC	Final optimum water content (for record, from 1-pt or 5-pt)*	KEY	DECIMAL	99.9

(Continued)

* Calculated automatically when data are loaded to data base (see para 28)

Table 1 (Continued)

Component Number	Element Abbreviation	Element Description	KEY/NON-KEY Designation	Type of Data	Field Size
111	DOWC	Deviation from optimum water content*	KEY	DECIMAL	99.9
113	PC	Percent compaction*	KEY	DECIMAL	999.9
115	CLR	Color	KEY	NAME	XXXX
117	USCC	Soil classification	KEY	NAME	7 characters
119	MPS	Maximum particle size in decimal form	KEY	DECIMAL	9.999
120	GR3I	Percent passing the 3-inch sieve	KEY	INTEGER	999
121	GR2I	Percent passing the 2-inch sieve	NON-KEY	INTEGER	999
123	GR15I	Percent passing the 1.5-inch sieve	NON-KEY	INTEGER	999
124	GR1I	Percent passing the 1-inch sieve	KEY	INTEGER	999
125	GR75I	Percent passing the 3/4-inch sieve	KEY	INTEGER	999
126	GR5I	Percent passing the 1/2-inch sieve	KEY	INTEGER	999
127	GR375I	Percent passing the 3/8-inch sieve	NON-KEY	INTEGER	999
129	GR4	Percent passing the No. 4 sieve	KEY	INTEGER	999
130	GR8	Percent passing the No. 8 sieve	KEY	INTEGER	999
131	GR10	Percent passing the No. 10 sieve	NON-KEY	INTEGER	999
133	GR16	Percent passing the No. 16 sieve	NON-KEY	INTEGER	999
135	GR40	Percent passing the No. 40 sieve	NON-KEY	INTEGER	999
137	GR100	Percent passing the No. 100 sieve	NON-KEY	INTEGER	999
139	GR200	Percent passing the No. 200 sieve	KEY	INTEGER	999
141	LL	Liquid Limit (std 4-pt or rapid 1-pt)	KEY	DECIMAL	999.9
143	PI	Plastic Index	KEY	INTEGER	99
145	GS	Specific gravity of solids	KEY	DECIMAL	9.99
146	GA	Apparent specific gravity	KEY	DECIMAL	9.99
147	GM	Bulk specific gravity	KEY	DECIMAL	9.99
148	G	Specific gravity	KEY	DECIMAL	9.99
149	COMMENTS	30-character field for comments about test; e.g., see note or retest number, etc.	NON-KEY	NAME	30 characters
150	QMDD	Quick maximum dry density	KEY	DECIMAL	999.9
151	QOWC	Quick optimum water content	KEY	DECIMAL	99.9
152	CMDD1	Corrected FOC maximum dry density	KEY	DECIMAL	999.9
153	COWC1	Corrected FOC optimum water content	KEY	DECIMAL	99.9
154	DOWC1	Deviation from optimum water content (1-pt test)*	KEY	DECIMAL	99.9
155	PC1	Percent compaction (1-pt test)*	KEY	DECIMAL	999.9

(Continued)

* Calculated automatically when data are loaded to data base (see para 28)

Table 1 (Concluded)

Component Number	Element Abbreviation	Element Description	KEY/NON-KEY Designation	Type of Data	Field Size
156	CNO	Five-point curve number	KEY	NAME	6 characters
157	MDD5	Five-point maximum dry density	KEY	DECIMAL	999.9
158	OWC5	Five-point optimum water content	KEY	DECIMAL	99.9
159	AB	Absorption	KEY	DECIMAL	9.9
160	CMDD5	Corrected five-point maximum dry density	KEY	DECIMAL	999.9
161	COWC5	Corrected five-point optimum water content	KEY	DECIMAL	99.9
162	DOWC5	Deviation from optimum water content (5-pt test)*	KEY	DECIMAL	99.9
163	PC5	Percent compaction (5-pt test)*	KEY	DECIMAL	999.9
164	PSAT	Percent saturation	KEY	DECIMAL	999.9
170	NOTES	REPEATING GROUP FOR NOTES			
171	NOTE	Notes for each report	NON-KEY	NAME	90 characters

* Calculated automatically when data are loaded to data base (see para 28)

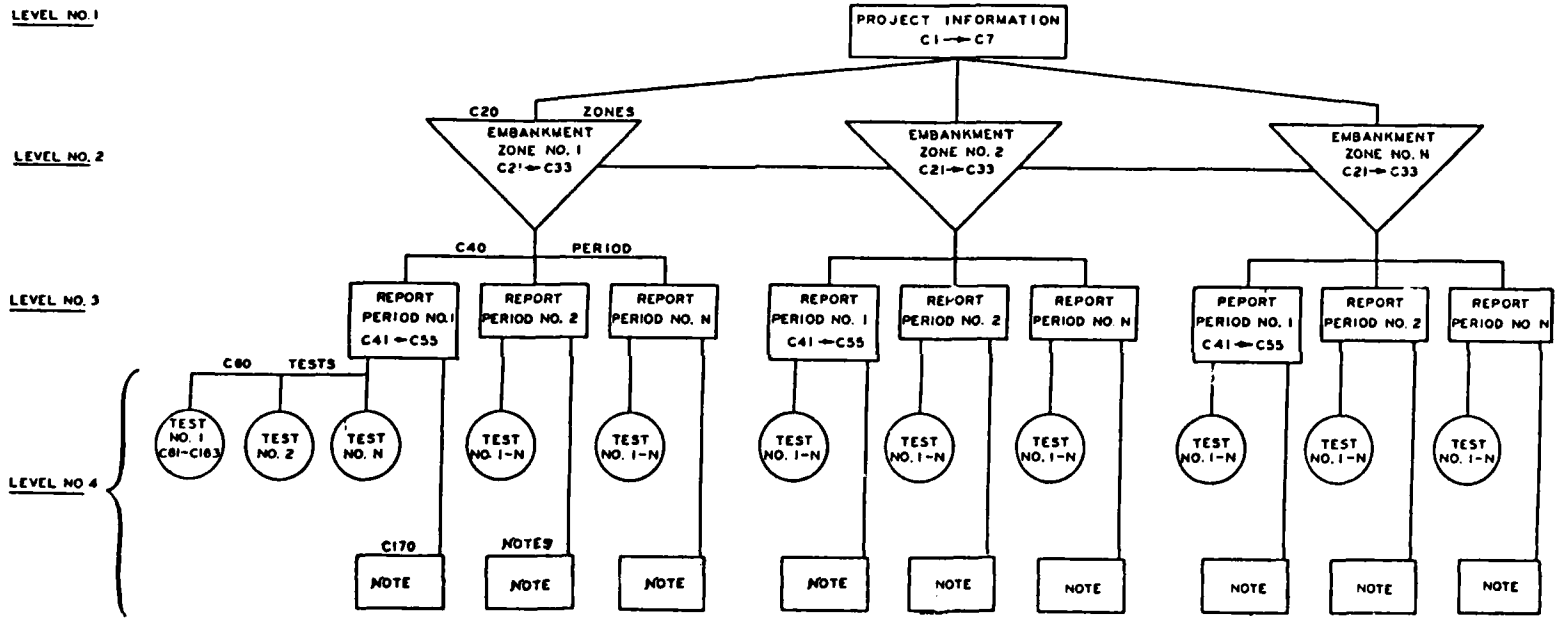


Figure 4. Schematic of data base structure showing component numbers in Table 1

PART III: DATA INPUT MODULE

22. There are three procedures available to the user for entering data to the data base. The first procedure entails using a data entry program that interfaces directly with the data base. This method keeps the data base on line the entire time the user is accessing the program. The second procedure generates a data file which is loaded to the data base at the user's convenience. This method only accesses the data base when the data file is being loaded. The same question-answer type format is used for both of the above procedures. The third procedure consists of adding data directly to the data base files while the user is working on line with the data base. With this procedure the data base is not protected against unexpected session interruptions. The first procedure is about three times more expensive to use than the second procedure because of the time the data base is on line. The expense of the last procedure depends upon how long the user has the data base on line. In addition to adding data to the data base, the third procedure will also explain how to change and remove data within the data base. All of the above procedures are described in this part of the report.

Data Entry Program - Interface with Data Base

Description

23. The data entry program is designed to collect raw data and insert the data directly into the data base. The program operates on a time-sharing basis in a conversational mode. The user is prompted for the data on an item by item basis, starting at the embankment zone level of the data base and proceeding to all lower levels (reports, tests, and notes). After each prompt, the computer waits for a carriage return before proceeding. It is possible to enter only the project information for the initial data base entry. The prompts used to request the items are contained in a separate driver file that the program accesses and are shown in Table 2. With the driver file separate from the program, the user can modify the prompts by editing this file. This procedure

interfaces with the data base as the user enters either the embankment zone, report number, or test number to determine whether the entered value is new or already exists. In addition, the program can check to ensure that the user does not enter either report information or test information to completed reports or tests. When the user ends a data entry session and successfully loads the data to the data base, the data is available immediately for retrievals.

24. The data entry program collects the data in logical groups as indicated in Table 2. The embankment zone and report period data each comprise a group. The test data are broken down into three groups because all of the test data are often not available at the same time. The first group which is entered immediately after the test is complete contains the location information, field results, and the 1-point compaction results. The second group contains the 5-point compaction results. The third group contains data which is available several days after the initial test and consists of classification, Atterberg limits, various specific gravities, and sieve analysis. A schematic diagram for the program is shown in Figure 5. An unlimited number of tests, reports, and embankment zones may be entered in one session. New embankment zones and report numbers can be entered at any time by completing the new zone or report information. Also, the user can enter one data group or any combination of data groups.

25. The program will allow the user to edit the data before inserting in the data base. After the entire data group or eight items have been entered, they will be automatically listed for the user to check. Any changes can be made at this time by following the instructions that are printed with the listed data. Once the user agrees that the items are correct, more data can be entered and those items that were reviewed are entered into the data base. Thus, if an error comes to light at a later time, the user can still change the value by following the CHANGE procedure described later in this part.

26. The data entry program contains some editing capabilities in addition to allowing the user to change the input values. Besides the prompts, the information in Table 3 is contained in the driver file that

Table 2

Prompts for Requested Information

in Data Entry Program

Project Information	PROJECT NAME?(40 CHAR. MAX)
	PROJECT RIVER?(40 CHAR. MAX)
	PROJECT COUNTY?(20 CHAR. MAX)
	PROJECT STATE?(2 CHAR. MAX)
	PROJECT TOWN?(20 CHAR. MAX)
	CONTRACT NUMBER?(20 CHAR. MAX)
	CONTRACTOR?(40 CHAR. MAX)
Embankment Zone	EMBANKMENT ZONE(INPUT END TO QUIT)?
	COMPACTION PERCENT?
	TYPE OF TEST?(3 CHAR. MAX)
	WL LIMIT?
	WR LIMIT?
	S PERCENT LESS THAN 200?
	FIELD MOLD SIZE?
Report Period	REPORT NUMBER(INPUT A 0 TO QUIT)?
	BEGINNING DATE? (MM/DD/YYYY)
	TYPE EQUIPMENT?(15 CHAR. MAX)
	LOOSE LIFT THICKNESS?
	COMPACTED LIFT THICKNESS?
	NUMBER OF PASSES?
	LAB COMPACTION EFFORT?
	ENDING DATE? (MM/DD/YYYY)
Test Data Group 1	TEST NUMBER(INPUT A 0 TO QUIT)?
	TEST DATE? (MM/DD/YYYY)
	QA OR QC LAB?(1 CHAR. MAX)
	STATION?(6 CHAR. MAX)
	OFFSET?
	ELEVATION?
	DEPTH IN INCHES?
	MATERIAL SOURCE?(10 CHAR. MAX)
	SOIL CLASSIFICATION?(7 CHAR. MAX)
	SOIL COLOR?(4 CHAR. MAX)
	MAXIMUM PARTICLE SIZE?
	FIELD WET DENSITY?
	QUICK FIELD WATER CONTENT?
	QUICK FIELD DRY DENSITY?
	FINAL FIELD WATER CONTENT?
	FINAL FIELD DRY DENSITY?

(Continued)

Table 2 (Concluded)

Test Data Group 1 Continued	LABORATORY MOLD SIZE? QUICK ONE-POINT WATER CONTENT? QUICK ONE-POINT DRY DENSITY? QUICK OPTIMUM WATER CONTENT? QUICK MAXIMUM DRY DENSITY? ONE-POINT DRY DENSITY? ONE-POINT WATER CONTENT? SECOND-POINT DRY DENSITY? SECOND-POINT WATER CONTENT? FOC MAXIMUM DRY DENSITY? FOC OPTIMUM WATER CONTENT? QUICK % GREATER THAN 3/4"? STD % GREATER THAN 3/4"? CORRECTED FOC MAXIMUM DRY DENSITY? CORRECTED FOC OPTIMUM WATER CONTENT? COMMENTS?(30 CHAR. MAX)
Test Data Group 2	5-POINT CURVE NUMBER?(6 CHAR. MAX) 5-POINT MAXIMUM DRY DENSITY? 5-POINT OPTIMUM WATER CONTENT? BULK SPECIFIC GRAVITY? ABSORPTION? CORRECTED 5-PT MAXIMUM DRY DENSITY? CORRECTED 5-PT OPTIMUM WATER CONTENT?
Test Data Group 3	LIQUID LIMIT? PLASTICITY INDEX? SPECIFIC GRAVITY OF SOLIDS? APPARENT SPECIFIC GRAVITY? SPECIFIC GRAVITY? % PASSING #200 SIEVE? % PASSING #100 SIEVE? % PASSING #40 SIEVE? % PASSING #16 SIEVE? % PASSING #10 SIEVE? % PASSING #8 SIEVE? % PASSING #4 SIEVE? % PASSING 3/8" SIEVE? % PASSING 1/2" SIEVE? % PASSING 3/4" SIEVE? % PASSING 1" SIEVE? % PASSING 1 1/2" SIEVE? % PASSING 2" SIEVE? % PASSING 3" SIEVE?

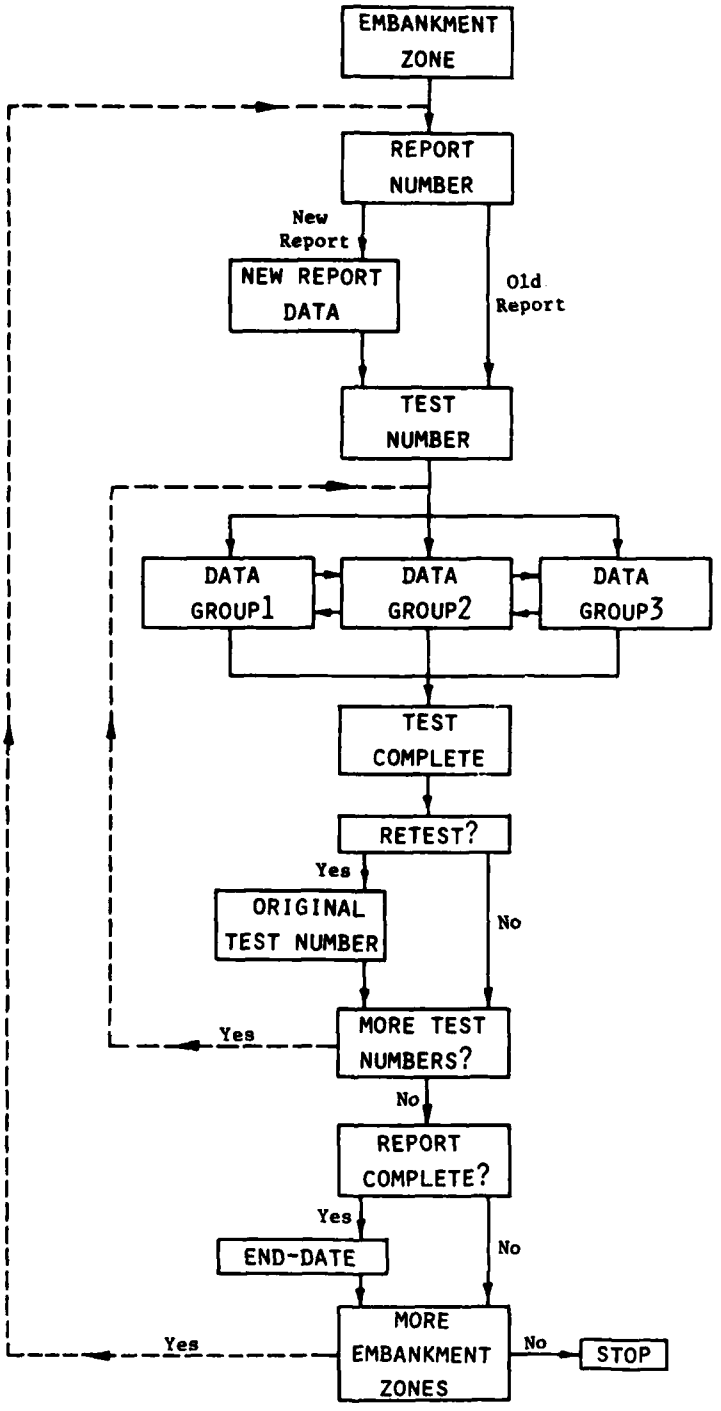


Figure 5. Schematic of data entry program

the data entry program accesses. The first column indicates the type of data item. The following chart shows the numeric definition of the different data types:

Type 1 ... Integer number
Type 2 ... Decimal number
Type 3 ... Character name
Type 4 ... Date

The second column indicates the length of the variable. The number of 10-letter computer words is shown for character and date items, while the number of digits is shown for numeric items. The next two columns contain the minimum and maximum values of numeric data items. If both values are zero, the item will not be checked; however, if one value is nonzero, the data are checked to ensure that the input value is within the minimum-maximum range. If the entered value is outside the range, the program will print the following message and will prompt the user for the same data item again: (entered value) IS NOT WITHIN THE LIMITS: [(minimum, maximum)]. The ranges should be set up when the system is initiated; however, the values can be changed when needed. The last two columns in the file are the position of the data item in the data base and the data base name of the item. Using this information, the program knows the type of data, the size, and a range for numeric values; thus, any large errors (wrong data type or shifts in the decimal point) are caught and the user is required to enter corrected values before the data are inserted into the data base.

27. There are some cautions the user needs to be aware of:

    a. Data should always be entered with no leading blanks.

    b. If a test is in the data base and the same test number is entered again, all the old data for that data group will be lost. However, if a different data group is added, the other information associated with that test will not be affected.

    c. Once the end date is entered for a report, that report is not available for changing or adding notes or test information. The end date is the way that other users and retrieval programs can check for complete reports.

    d. The following error messages are generated by the program as a result of its internal editing:

Table 3

Data Element Editing Information

Type	Length	Limits Min.	Limits Max.	Position	Name
3	4	0.	0.	1	PROJ-NAME
3	4	0.	0.	5	PROJ-RIVER
3	2	0.	0.	9	PROJ-COUNTY
3	1	0.	0.	11	PROJ-STATE
3	2	0.	0.	12	PROJ-TOWN
3	2	0.	0.	14	CONTRACT-NO
3	4	0.	0.	16	CONTRACTOR
3	2	0.	0.	1	EMBANK-ZONE
2	7	90.0	98.0	3	COMP-PERCENT
3	1	0.	0.	4	TEST-TYPE
1	2	-3.	0.	5	WL-LIMIT
1	2	0.	12.	6	WR-LIMIT
1	2	0.	0.	7	S-PLT200
1	2	0.	0.	8	FMS
1	3	0.	0.	9	REPORT-NO
4	1	0.	0.	1	BEGIN-DATE
3	2	0.	0.	3	EQUIP
1	2	0.	0.	5	LLT
1	2	0.	0.	6	CMPT
1	2	0.	0.	7	PASSES
3	1	0.	0.	8	C-EFFORT
4	1	0.	0.	2	END-DATE
1	6	0.	0.	1	NO
4	1	0.	0.	4	DATE-MADE
3	1	0.	0.	5	LAB
3	1	0.	0.	6	STA
1	6	0.	0.	7	OFT
2	6	0.	0.	8	ELE
1	2	0.	0.	9	DEP
3	1	0.	0.	10	MS
3	1	0.	0.	33	USCG
3	1	0.	0.	32	CLR
2	6	0.	0.	34	MPS
2	6	0.	0.	11	FWD
2	5	2.	14.	15	QFWC
2	6	0.	0.	14	QFDD
2	5	0.	0.	13	FWC
2	6	0.	0.	12	FDD
1	2	0.	0.	16	LMS

(Continued)

Table 3 (Concluded)

Type	Length	Limits Min.	Limits Max.	Position	Name
2	5	0.	0.	20	Q1WC
2	6	0.	0.	19	Q1DD
2	5	0.	0.	58	QOWC
2	6	0.	0.	57	QMDD
2	6	0.	0.	17	DD1
2	5	0.	0.	18	WC1
2	6	0.	0.	21	DD2
2	5	0.	0.	22	WC2
2	6	0.	0.	24	MDD1
2	5	0.	0.	25	OWC1
1	2	0.	0.	27	QRCP
1	2	0.	0.	26	RCP
2	6	0.	0.	59	CMDD1
2	5	0.	0.	60	COWC1
3	3	0.	0.	54	COMMENTS
3	1	0.	0.	63	CNO
2	6	0.	0.	64	MDD5
2	5	0.	0.	65	OWC5
2	5	0.	0.	52	GM
2	3	0.	0.	66	AB
2	6	0.	0.	67	CMDD5
2	5	0.	0.	68	COWC5
3	1	0.	0.	33	USCG
1	3	0.	0.	48	LL
1	2	0.	0.	49	PI
2	5	0.	0.	50	GS
2	5	0.	0.	51	GA
2	5	0.	0.	53	G
1	3	0.	0.	47	GR200
1	3	0.	0.	46	GR100
1	3	0.	0.	45	GR40
1	3	0.	0.	44	GR16
1	3	0.	0.	43	GR10
1	3	0.	0.	72	GR8
1	3	0.	0.	42	GR4
1	3	0.	0.	41	GR375I
1	3	0.	0.	40	GR5I
1	3	0.	0.	39	GR75I
1	3	0.	0.	38	GR1I
1	3	0.	0.	37	GR15I
1	3	0.	0.	36	GR2I
1	3	0.	0.	35	GR3I

OOPS! NOT A VALID INTEGER, TRY AGAIN

OOPS! NOT A VALID REAL, TRY AGAIN

OOPS! NOT A VALID DATE, TRY AGAIN

However, if the following error message is generated when the program loads the data to the data base, the user needs to contact the system administrator to determine where the error is:

WRAP UP CALLED BY ROUTINE, 'ROUTINE NAME,' AFTER THE DATA BASE OPERATION OF, 'DATA BASE OPERATION,' WITH A RETURN CODE OF, 'RETURN CODE'

e. All the data is printed back to the user for editing except for the embankment zone, report number, and test number. If one of these values is entered incorrectly, the only way to change the value is to return to that level of the program by indicating that the user is not ready to enter more data to the incorrect embankment zone, report number, or test number. For example, if report number 6 was entered but report number 5 was intended and report number 6 did not exist, the program will indicate a new report and ask if you were ready to enter the new report data, the user would indicate 'NO.' The program would then ask for the next report number, now the user would enter the report number 5. If report number 6 existed when it was entered erroneously, the user would enter 0 for both the test number and group number to return to the report level. The same procedure would be used for errors in the embankment zone and test number. These corrections are illustrated in the next section (Example 3).

28. The program automatically generates the percent compaction, percent saturation, and the deviation from optimum water content using the following equations:

PC1 = (FDD/CMDD1) X 100

= (FIELD DRY DENSITY/MAXIMUM DRY DENSITY FROM 1-POINT TEST) X 100

PC5 = (FDD/CMDD5) X 100

PSAT = FDD X FWC X G/(G X 62.4) - FDD (WARNING MESSAGE IF VALUE GREATER THAN 100.5 PERCENT)

DOWC1 = FWC - COWC1

= FIELD WATER CONTENT - OPTIMUM WATER CONTENT FROM 1-POINT TEST

DOWC5 = FWC - COWC5

The data names are defined in Table 1. When only a 1-point test is run, the maximum dry density, optimum water content, percent compaction, and deviation from optimum water content of record are based on this test. However, when both a 1-point and 5-point test are run, the results of record are obtained from the 5-point test. The following tabulation using the abbreviated data element names defined in Table 1 illustrates this concept:

Element name	Data for only 1-pt test	Data for both 1-pt and 5-pt test
CT	1	5
FMDD	CMDD1	CMDD5
FOWC	COWC1	COWC5
DOWC	DOWC1	DOWC5
PC	PC1	PC5

29. As previously mentioned, the data entry system works interactively with the data base. The following commands are required to use this procedure:

GET, INPXXX

CALL, INPXXX

where XXX identifies the project (e.g., Warm Springs Dam = WSD). The examples in the next section illustrate this procedure. Because of the high cost of working on line with the data base, modifications were made to this program to develop a data file entry procedure which will be described in the next section.

Examples

30. Example 1. This example, shown in Table 4, illustrates the data entry program operation for a new embankment zone, report number, and for all three data groups of a new test number. Throughout the example the data correction and the program editing capabilities are shown. The cost to enter this example will vary according to the size of the existing data base. For a small data base, the cost was about twelve dollars.

Table 4

Data Entry Procedures During Interface with Data Base (Example 1)

```
C>GET,INPUSD
C>CALL,INPUSD


        DATA ENTRY SYSTEM FOR DAM CONSTRUCTION

 1...EMBANKMENT ZONE(INPUT END TO QUIT)?
I>RANDOM I

RANDOM I              IS A NEW EMBANKMENT ZONE

ARE YOU READY TO INPUT NEW VALUES? (Y OR N)
I>Y
 1...COMPACTION PERCENT?          Start embankment zone data
I>95.0
 2...TYPE OF TEST?(3 CHAR. MAX)
I>SV
 3...WL LIMIT?
I>-2.0
 4...WR LIMIT?
I>3.0
OOPS! NOT A VALID INTEGER, TRY AGAIN    Attempted to enter
                                        a real value instead
                                        of an integer
 4...WR LIMIT?
I>3
 5...S PERCENT LESS THAN 200?
I>25
 6...FIELD MOLD SIZE?
I>6

REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ 95.0
   2 ........ SV
   3 ........ -2
   4 ........ 3
   5 ........ 25
   6 ........ 6

TO CHANGE AN ITEM, TYPE ITS LINE #    End of embankment zone data
OTHERWISE HIT RETURN
I>
```

(Continued)

(Sheet 1 of 8)

Table 4 (Continued)

```
 1...REPORT NUMBER(INPUT A 0 TO QUIT)?
I>1

    1 IS A NEW REPORTING PERIOD

ARE YOU READY TO INPUT NEW VALUES? (Y OR N)
I>Y
 1...BEGINNING DATE? (MM/DD/YYYY)
I>02/24/1981
 2...TYPE EQUIPMENT?(15 CHAR. MAX)
I>SHEEPFOOT ROL
 3...LOOSE LIFT THICKNESS?
I>6
 4...COMPACTED LIFT THICKNESS?
I>4
 5...NUMBER OF PASSES?
I>6
 6...LAB COMPACTION EFFORT?
I>STD

REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ 02/24/1981
   2 ........ SHEEPFOOT ROL
   3 ........ 6
   4 ........ 4
   5 ........ 6
   6 ........ STD

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>6
6...LAB COMPACTION EFFORT?
I>MOD

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>

DO YOU WISH TO REVIEW VALUES AGAIN? (Y OR N)


I>Y

REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ 02/24/1981
   2 ........ SHEEPFOOT ROL
   3 ........ 6
   4 ........ 4
   5 ........ 6
   6 ........ MOD

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
```

Start Report Period Data

Entered wrong information

Wrong

Line #6 corrected

Corrected

End of report period data

(Continued)

Table 4 (Continued)

```
 1...TEST NUMBER(INPUT A 0 TO QUIT)?
I>10001

10001 IS A NEW TEST

ARE YOU READY TO INPUT NEW VALUES? (Y OR N)
I>Y
INPUT THE TEST GROUP (1,2 OR 3)
INPUT A ZERO TO QUIT                    Start test data group 1
I>1
 1...TEST DATE? (MM/DD/YYYY)
I>02/22/1981
 2...QA OR QC LAB?(1 CHAR. MAX)
I>A
 3...STATION?(6 CHAR. MAX)
I>25+00
 4...OFFSET?
I>120.                                  Attempted to enter
OOPS! NOT A VALID INTEGER, TRY AGAIN    a real value instead
                                        of an integer

 4...OFFSET?
I>120
 5...ELEVATION?
I>345.8
 6...DEPTH IN INCHES?
I>6
 7...MATERIAL SOURCE?(10 CHAR. MAX)
I>BORROW I
 8...SOIL CLASSIFICATION?(7 CHAR. MAX)
I>ML-CL

REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ 02/22/1981
   2 ........ A
   3 ........ 25+00
   4 ........ 120
   5 ........ 345.8
   6 ........ 6
   7 ........ BORROW I
   8 ........ ML-CL

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
```

(Continued)

Table 4 (Continued)

```
 1...SOIL COLOR?(4 CHAR. MAX)
I>RBR
 2...MAXIMUM PARTICLE SIZE?
I>1.75
 3...FIELD WET DENSITY?
I>)i134.0
 4...QUICK FIELD WATER CONTENT?
I>12.2
 5...QUICK FIELD DRY DENSITY?
I>125.1
 6...FINAL FIELD WATER CONTENT?
I>11.9
 7...FINAL FIELD DRY DENSITY?
I>124.5
 8...LABORATORY MOLD SIZE?
I>6

REVIEW OF INPUT
LINE #         DATA VALUE
   1 ........ RBR
   2 ........ 1.75
   3 ........ 134.0
   4 ........ 12.2
   5 ........ 125.1
   6 ........ 11.9
   7 ........ 124.5
   8 ........ 6

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
 1...QUICK ONE-POINT WATER CONTENT?
I>126.0
 2...QUICK ONE-POINT DRY DENSITY?
I>126.0
 3...QUICK OPTIMUM WATER CONTENT?
I>11.4
 4...QUICK MAXIMUM DRY DENSITY?
I>127.0
 5...ONE-POINT DRY DENSITY?
I>125.5
 6...ONE-POINT WATER CONTENT?
I>9.9
 7...SECOND-POINT DRY DENSITY?
I>
 8...SECOND-POINT WATER CONTENT?
I>
```

Entered wrong value

If there are no data to be entered, user must hit carriage return to continue

(Continued)

Table 4 (Continued)

```
REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ 126.0          Wrong
   2 ........ 126.0
   3 ........ 11.4
   4 ........ 127.0
   5 ........ 125.5
   6 ........ 9.9
   7 ........
   8 ........

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>1
1...QUICK ONE-POINT WATER CONTENT?        Line #1
I>10.3                                    Corrected

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>

DO YOU WISH TO REVIEW VALUES AGAIN? (Y OR N)


I>Y

REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ 10.3           Corrected
   2 ........ 126.0
   3 ........ 11.4
   4 ........ 127.0
   5 ........ 125.5
   6 ........ 9.9
   7 ........
   8 ........

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
```

(Continued)

Table 4 (Continued)

```
 1...FOC MAXIMUM DRY DENSITY?
I>126.5
 2...FOC OPTIMUM WATER CONTENT?
I>11.0
 3...QUICK % GREATER THAN 3/4"?
I>6
 4...STD % GREATER THAN 3/4"?
I>8
 5...CORRECTED FOC MAXIMUM DRY DENSITY?
I>126.5
 6...CORRECTED FOC OPTIMUM WATER CONTENT?
I>11.0
 7...COMMENTS?(30 CHAR. MAX)
I>NG

REVIEW OF INPUT
LINE #        DATA VALUE
   1 ........ 126.5
   2 ........ 11.0
   3 ........ 6
   4 ........ 8
   5 ........ 126.5
   6 ........ 11.0
   7 ........ NG

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN                    End of test data group 1
I>


INPUT THE TEST GROUP (1,2 OR 3)         Start test data group 2
INPUT A ZERO TO QUIT
I>2
 1...5-POINT CURVE NUMBER?(6 CHAR. MAX)
I>R-722
 2...5-POINT MAXIMUM DRY DENSITY?
I>132.5
 3...5-POINT OPTIMUM WATER CONTENT?
I>8.5
 4...BULK SPECIFIC GRAVITY?
I>2.70
 5...ABSORPTION?
I>2.1
 6...CORRECTED 5-PT MAXIMUM DRY DENSITY?
I>132.5
 7...CORRECTED 5-PT OPTIMUM WATER CONTENT?
I>8.5

REVIEW OF INPUT
LINE #        DATA VALUE
   1 ........ R-722
   2 ........ 132.5
   3 ........ 8.5
   4 ........ 2.70
   5 ........ 2.1
   6 ........ 132.5
   7 ........ 8.5

TO CHANGE AN ITEM, TYPE ITS LINE #      End of test data group 2
OTHERWISE HIT RETURN
I>
```

(Continued)

Table 4 (Continued)

```
INPUT THE TEST GROUP (1,2 OR 3)
INPUT A ZERO TO QUIT                    Start test data group 3
I>3
 1...SOIL CLASSIFICATION?(7 CHAR. MAX)
I>ML-CL
 2...LIQUID LIMIT?
I>34
 3...PLASTICITY INDEX?
I>18
 4...SPECIFIC GRAVITY OF SOLIDS?
I>2.68
 5...APPARENT SPECIFIC GRAVITY?
I>2.69
 6...SPECIFIC GRAVITY?
I>2.70
 7...% PASSING #200 SIEVE?
I>22
 8...% PASSING #100 SIEVE?
I>30

REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ ML-CL
   2 ........ 34
   3 ........ 18
   4 ........ 2.68
   5 ........ 2.69
   6 ........ 2.70
   7 ........ 22
   8 ........ 30

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
 1...% PASSING #40 SIEVE?
I>33
 2...% PASSING #16 SIEVE?
I>42
 3...% PASSING #10 SIEVE?
I>49
 4...% PASSING #4  SIEVE?
I>52
 5...% PASSING 3/8" SIEVE?
I>60
 6...% PASSING 1/2" SIEVE?
I>65
 7...% PASSING 3/4" SIEVE?
I>70
 8...% PASSING 1" SIEVE?
I>
```

(Continued)

Table 4 (Concluded)

```
REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ 33
   2 ........ 42
   3 ........ 49
   4 ........ 52
   5 ........ 60
   6 ........ 65
   7 ........ 70
   8 ........

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
 1...% PASSING 1 1/2" SIEVE?
I>95
 2...% PASSING 2" SIEVE?
I>100
 3...% PASSING 3" SIEVE?
I>100

REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ 95
   2 ........ 100
   3 ........ 100

TO CHANGE AN ITEM, TYPE ITS LINE #      End of test data group 3
OTHERWISE HIT RETURN
I>
INPUT THE TEST GROUP (1,2 OR 3)
INPUT A ZERO TO QUIT
I>0


IS THIS TEST COMPLETE(Y OR N)?
I>Y
IS THIS TEST A RETEST? (Y OR N)


I>N
 1...TEST NUMBER(INPUT A 0 TO QUIT)?     Exit test level
I>0
IS THIS REPORT PERIOD COMPLETED? (Y OR N)
I>N
 1...REPORT NUMBER(INPUT A 0 TO QUIT)?
I>2                                      Entered wrong report
                                                number
    2 IS A NEW REPORTING PERIOD

ARE YOU READY TO INPUT NEW VALUES? (Y OR N)
I>N
 1...REPORT NUMBER(INPUT A 0 TO QUIT)?
I>0
 1...EMBANKMENT ZONE(INPUT END TO QUIT)?     Proper termination
I>END
DATABASE CLOSED AND DATA ENTRY TERMINATED


CC,OFF.
C>
```

31. Example 2. This example, shown in Table 5, illustrates the data entry program operation for an existing embankment zone and report number, and data groups 1 and 3 for a new test number. This example costs about eight dollars to enter to a small data base. The cost will vary according to the size of the data base.

Table 5

Data Entry Procedure for Existing Embankment

Zone and Report Number (Example 2)

```
C>GET,INPUSD
C>CALL,INPUSD


        DATA ENTRY SYSTEM FOR DAM CONSTRUCTION

 1...EMBANKMENT ZONE(INPUT END TO QUIT)?
I>RANDOM I                                    Existing zone
 1...REPORT NUMBER(INPUT A 0 TO QUIT)?        Existing report interval
I>1
 1...TEST NUMBER(INPUT A 0 TO QUIT)?
I>10002

10002 IS A NEW TEST

ARE YOU READY TO INPUT NEW VALUES? (Y OR N)
I>Y
INPUT THE TEST GROUP (1,2 OR 3)
INPUT A ZERO TO QUIT                          Start test data group 1
I>1
 1...TEST DATE? (MM/DD/YYYY)
I>02/23/1981
 2...QA OR QC LAB?(1 CHAR. MAX)
I>C
 3...STATION?(6 CHAR. MAX)
I>10+75
 4...OFFSET?
I>-1010
 5...ELEVATION?
I>352.9
 6...DEPTH IN INCHES?
I>6
 7...MATERIAL SOURCE?(10 CHAR. MAX)
I>BOR I
 8...SOIL CLASSIFICATION?(7 CHAR. MAX)
I>GC

REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ 02/23/1981
   2 ........ C
   3 ........ 10+75
   4 ........ -1010
   5 ........ 352.9
   6 ........ 6
   7 ........ BOR I
   8 ........ GC

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
```

(Continued)

Table 5 (Continued)

```
 1...SOIL COLOR?(4 CHAR. MAX)
I>DRRN
 2...MAXIMUM PARTICLE SIZE?
I>2.0
 3...FIELD WET DENSITY?
I>139.0
 4...QUICK FIELD WATER CONTENT?
I>12.0
 5...QUICK FIELD DRY DENSITY?
I>128.0
 6...FINAL FIELD WATER CONTENT?
I>15.
 7...FINAL FIELD DRY DENSITY?
I>127.0
 8...LABORATORY MOLD SIZE?
I>6

REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ DRRN
   2 ........ 2.0
   3 ........ 139.0
   4 ........ 12.0
   5 ........ 128.0
   6 ........ 15.
   7 ........ 127.0
   8 ........ 6

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>6
6...FINAL FIELD WATER CONTENT?
I>11.0

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>

DO YOU WISH TO REVIEW VALUES AGAIN? (Y OR N)


I>N
```

Entered wrong value

Wrong

Line #6 corrected

(Continued)

Table 5 (Continued)

```
 1...QUICK ONE-POINT WATER CONTENT?
I>8.0
 2...QUICK ONE-POINT DRY DENSITY?
I>126.9
 3...QUICK OPTIMUM WATER CONTENT?
I>9.6
 4...QUICK MAXIMUM DRY DENSITY?
I>131.
 5...ONE-POINT DRY DENSITY?
I>126.0
 6...ONE-POINT WATER CONTENT?
I>7.3
 7...SECOND-POINT DRY DENSITY?
I>
 8...SECOND-POINT WATER CONTENT?
I>

REVIEW OF INPUT
LINE #        DATA VALUE
   1 ........ 8.0
   2 ........ 126.9
   3 ........ 9.6
   4 ........ 131.
   5 ........ 126.0
   6 ........ 7.3
   7 ........
   8 ........

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
 1...FOC MAXIMUM DRY DENSITY?
I>131.5
 2...FOC OPTIMUM WATER CONTENT?
I>9.0
 3...QUICK % GREATER THAN 3/4"?
I>10
 4...STD % GREATER THAN 3/4"?
I>13
 5...CORRECTED FOC MAXIMUM DRY DENSITY?
I>132.0
 6...CORRECTED FOC OPTIMUM WATER CONTENT?
I>8.7
 7...COMMENTS?(30 CHAR. MAX)
I>NG

REVIEW OF INPUT
LINE #        DATA VALUE
   1 ........ 131.5
   2 ........ 9.0
   3 ........ 10
   4 ........ 13
   5 ........ 132.0
   6 ........ 8.7
   7 ........ NG

TO CHANGE AN ITEM, TYPE ITS LINE #
```

End of test data group 1

(Continued)

Table 5 (Continued)

```
INPUT THE TEST GROUP (1,2 OR 3)
INPUT A ZERO TO QUIT
I>0
IS THIS TEST COMPLETE(Y OR N)?
I>N
IS THIS TEST A RETEST? (Y OR N)

I>Y                                    Indicating a
INPUT THE RETEST NUMBER                retest and its
                                       original test
TYPE A ZERO TO STOP                    number

I>10001
 1...TEST NUMBER(INPUT A 0 TO QUIT)?
I>10003                                Entered wrong
                                        test number
10003 IS A NEW TEST

ARE YOU READY TO INPUT NEW VALUES? (Y OR N)
I>N
 1...TEST NUMBER(INPUT A 0 TO QUIT)?
I>10002
INPUT THE TEST GROUP (1,2 OR 3)
INPUT A ZERO TO QUIT                   Start test data group 3
I>3
 1...SOIL CLASSIFICATION?(7 CHAR. MAX)
I>GC
 2...LIQUID LIMIT?
I>21
 3...PLASTICITY INDEX?
I>10
 4...SPECIFIC GRAVITY OF SOLIDS?
I>2.74
 5...APPARENT SPECIFIC GRAVITY?
I>
 6...SPECIFIC GRAVITY?
I>2.72
 7...% PASSING #200 SIEVE?
I>26
 8...% PASSING #100 SIEVE?
I>30

REVIEW OF INPUT
LINE #         DATA VALUE
   1 ........ GC
   2 ........ 21
   3 ........ 10
   4 ........ 2.74
   5 ........
   6 ........ 2.72
   7 ........ 26
   8 ........ 30

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
```

(Continued)

Table 5 (Continued)

```
 1...% PASSING #40 SIEVE?
I>37
 2...% PASSING #16 SIEVE?
I>43
 3...% PASSING #10 SIEVE?
I>50
 4...% PASSING #4  SIEVE?
I>55
 5...% PASSING 3/8" SIEVE?
I>60
 6...% PASSING 1/2" SIEVE?
I>
 7...% PASSING 3/4" SIEVE?
I>75
 8...% PASSING 1" SIEVE?
I>80

REVIEW OF INPUT
LINE #        DATA VALUE
   1 ........ 37
   2 ........ 43
   3 ........ 50
   4 ........ 55
   5 ........ 60
   6 ........
   7 ........ 75
   8 ........ 80

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
 1...% PASSING 1 1/2" SIEVE?
I>90
 2...% PASSING 2" SIEVE?
I>100
 3...% PASSING 3" SIEVE?
I>

REVIEW OF INPUT
LINE #        DATA VALUE
   1 ........ 90
   2 ........ 100
   3 ........

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
```

End of test data group 3

(Continued)

Table 5 (Concluded)

```
INPUT THE TEST GROUP (1,2 OR 3)
INPUT A ZERO TO QUIT
I>0
IS THIS TEST COMPLETE(Y OR N)?
I>Y
IS THIS TEST A RETEST? (Y OR N)

I>N
 1...TEST NUMBER(INPUT A 0 TO QUIT)?
I>10001
THIS TEST IS COMPLETE, SORRY

 1...TEST NUMBER(INPUT A 0 TO QUIT)?
I>10002
THIS TEST IS COMPLETE, SORRY

 1...TEST NUMBER(INPUT A 0 TO QUIT)?
I>10003

10003 IS A NEW TEST

ARE YOU READY TO INPUT NEW VALUES? (Y OR N)
I>N
 1...TEST NUMBER(INPUT A 0 TO QUIT)?
I>0
IS THIS REPORT PERIOD COMPLETED? (Y OR N)
I>Y
TYPE THE REPORT END DATE (MM/DD/YYYY)?

I>02/28/1981
ARE THERE ANY NOTES FOR THIS REPORT?(Y OR N)
I>N
 1...REPORT NUMBER(INPUT A 0 TO QUIT)?
I>1

    1 IS A CLOSED REPORT, SORRY
 1...REPORT NUMBER(INPUT A 0 TO QUIT)?
I>0
 1...EMBANKMENT ZONE(INPUT END TO QUIT)?
I>END
DATABASE CLOSED AND DATA ENTRY TERMINATED


CC,OFF.
C>
```

Attempting to enter data to completed test

Entering end-date to report period

Notes

Attempting to enter data to a completed report

Data Entry Program - Using a Data File

Description

32. This data entry procedure consists of two programs. The first program is used to collect the new data and build a data file which is loaded to the data base using the second program. As in the first procedure, the data collection program operates on a time-sharing basis in a conversational mode. The prompting for the data on an item by item basis and all the editing capabilities described previously for the first procedure operate the same way for this procedure. The data groups and the external driver file are the same for both procedures. The percent compaction and deviation from optimum water content are calculated in this procedure as described in paragraph 28. When both 1-point and 5-point tests are run, the results of the 5-point test are used for the maximum dry density, optimum water content, percent compaction, and deviation from optimum water content as illustrated in paragraph 28.

33. The collection program does not interface with the data base; thus it cannot determine whether an embankment zone, report number, or test number is new or existing or whether the data for a report period or test number is complete. Therefore, the user is asked whether these levels are new or old. If only a portion of the data for a test is available for entry, the collect program will accept the information but the load program will not load the information to a completed report period or test number. The advantage of this procedure is the cost savings. With the first procedure the two examples cost about twelve and eight dollars, while with this procedure the same examples cost about four and a half and four dollars to enter the data and about seventy-five cents each to load to the data base.

34. There are some cautions for this procedure the user needs to be aware of:

a. Data should always be entered with no leading blanks.

b. The collection program does not check for test information that was previously entered. However, the load program

will generate an error message in SUMFLE (generated during the load process) and not load duplicate information to the data base. No error message will be generated nor data loaded when the report period or test has previously been indicated as complete.

c. Once the end date is entered for a report, that report is not available for changing or adding notes or test information. If the data need to be changed, the user must make the change within the data base as described in the next section. The end date is the way that other users and retrieval programs can check for complete reports.

d. The following error messages are generated by the data collection program as a result of its internal editing:

OOPS! NOT A VALID INTEGER, TRY AGAIN

OOPS! NOT A VALID REAL, TRY AGAIN

OOPS! NOT A VALID DATE, TRY AGAIN

The load program will generate the following error message in SUMFLE if the data cannot be loaded:

WRAP UP CALLED BY ROUTINE 'ROUTINE NAME' AFTER THE DATA BASE OPERATION OF 'DATA BASE OPERATION' WITH A RETURN CODE OF 'RETURN CODE' WITH A LEVEL NUMBER OF 'LEVEL NUMBER'

If this occurs, the user needs to contact the system administrator to determine the cause of the error and how to correct the data file.

e. All the data is printed back to the user for editing except for the embankment zone, report number, and test number. If either the embankment zone or report number is entered incorrectly, the only way to change the value is to return to that level of the program by indicating that the embankment zone or report number is old and the test number is zero. For the report period the user will have to answer additional questions concerning the completeness of the report period. If the test number is incorrectly entered, the user must enter a zero when asked to select a data group. Two additional questions must be answered negatively before the program will ask for the test number again. Examples of how these corrections are made are shown in the following example section.

35. The following two-step process is involved in loading data to the data base using this procedure:

a. A data file is created by using the data collection program that prompts the user for the data. This program does not access the data base. The commands executing the collection program are:

GET, INPXXX

CALL, INPXXX

where XXX identifies the project. This program creates a data file called DATXXX.

b. The data file (DATXXX) is loaded to the data base using the load program that requires no input from the user other than the following commands:

GET, UPDXXX

CALL, UPDXXX

A batch load program, UPDXXXB, is recommended for a large data file. Batch loading is done on a lower priority and will reduce the cost by about 80 percent compared with interactive loading. The only other difference is that the batch load data will not be available for immediate retrieval. During the load process a file called SUMFLE is created indicating the embankment zones, report number, test numbers, and test data groups that are loaded into the data base. If any problems develop during the load process, the error message will be located in this file. Figure 6 shows an example of SUMFLE with no errors, while Figure 7 illustrates the file when an error has occurred. This error must be corrected in the data file DATXXX as illustrated in Figure 8 before the user attempts to load the data again. (See Appendix D for use of CMEDIT on BCS.) After the data is successfully loaded to the data base, the data file created in the first step must be cleared and readied for more data. To accomplish this, the following commands are used:

GET, CLRXXX

CALL, CLRXXX

Examples

36. Example 3. This example, shown in Table 6, illustrates the data file entry procedure. The data used in this example are the same as used in Example 1. Throughout the example the data correction and program-editing capabilities are shown. The cost to enter this example to the data file is about four and a half dollars. An additional seventy-five cents is required to load the data to the data base. Thus, a total cost of entering this example is five and a quarter dollars.

```
C>OLD SUMFLE
C>LIST
 N ZONE  IMP                        .........ZONE
 N REPRT                 11         ........ REPORT
 N TEST                  1416       .........TEST
  GROUP #1←Data group #1
  GROUP #NO-RETEST
 TEST IN←Test entered into data base
 TEST ENDTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST                  1417       .........TEST
  GROUP #1
  GROUP #NO-RETEST
 TEST IN
 TEST ENDTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST                  1418       .........TEST
  GROUP #1
  GROUP #YES-RETEST
 TEST IN
 TEST ENDTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST  NO-REPORT END DATE
 N REPRT ZZZZZZZZZZZZZZZZZZZZ END OF ZONE
 N ZONE  SAND FILTER                .........ZONE
 N REPRT                 11         ........ REPORT
 N TEST                  7444       .........TEST
  GROUP #1
  GROUP #NO-RETEST
 TEST IN
 TEST ENDTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST  NO-REPORT END DATE
 N REPRT ZZZZZZZZZZZZZZZZZZZZ END OF ZONE
 N ZONE  COARSE FILT                .........ZONE
 N REPRT                 11         ........ REPORT
 N TEST                  8062       .........TEST
  GROUP #2←Data group #2
  GROUP #NO-RETEST
 TEST IN
 TEST ENDTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST                  8063       .........TEST
  GROUP #1
  GROUP #NO-RETEST
 TEST IN
 TEST ENDTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST  NO-REPORT END DATE
 N REPRT ZZZZZZZZZZZZZZZZZZZZ END OF ZONE
 N ZONE  IMP                        .........ZONE
 N REPRT                 11         ........ REPORT
 N TEST                  4075       .........TEST
  GROUP #1
  GROUP #NO-RETEST
 TEST IN
 TEST ENDTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST                  4076       .........TEST
  GROUP #1
  GROUP #NO-RETEST
 TEST IN
 TEST ENDTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST                  4077       .........TEST
  GROUP #1
  GROUP #NO-RETEST
 TEST IN
 TEST ENDTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST  NO-REPORT END DATE
 N REPRT ZZZZZZZZZZZZZZZZZZZZ END OF ZONE
 N ZONE  IMP                        .........ZONE
 N REPRT                 11         ........ REPORT
 N TEST                  1420       .........TEST
  GROUP #2
  GROUP #NO-RETEST
 TEST IN
 TEST ENDTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST  NO-REPORT END DATE
 N REPRT ZZZZZZZZZZZZZZZZZZZZ END OF ZONE
 N ZONE  IMP WET                    .........ZONE
 N REPRT                 5          ........ REPORT
 N TEST                  3089       .........TEST
  GROUP #1
  GROUP #NO-RETEST
 TEST IN
 TEST ENDTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST  NO-REPORT END DATE
 N REPRT ZZZZZZZZZZZZZZZZZZZZ END OF ZONE
 N ZONE  ZZZZZZZZZZZZZZZZZZZZ END OF ZONE
```

Figure 6. Example of SUMFLE with no load errors

```
OLD,SUMFLE
C>LIST
 N DONE   69 IUR                  .........DONE
 N REPORT                    1    ......... REPORT
 N TEST                      5001 .........TEST
  GROUP G1
  GROUP GNO-RETEST
TEST IN
TEST ENDTTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST                      5002 .........TEST
  GROUP G1
  GROUP GNO-RETEST
TEST IN
TEST ENDTTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST                      5003 .........TEST
  GROUP G1
  GROUP GYES-RETEST
TEST IN
TEST ENDTTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST                      5004 .........TEST
  GROUP G1
  GROUP GNO-RETEST
TEST IN
TEST ENDTTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST                      5005 .........TEST
  GROUP G1
  GROUP GNO-RETEST
TEST IN
TEST ENDTTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST                      5006 .........TEST
  GROUP G1
  GROUP GNO-RETEST
TEST IN
TEST ENDTTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST                      5007 .........TEST
  GROUP G1
  GROUP GNO-RETEST
TEST IN
TEST ENDTTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST                      5008 .........TEST
  GROUP G1
  GROUP GNO-RETEST
TEST IN
TEST ENDTTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST                      5009 .........TEST
  GROUP G1
  GROUP GNO-RETEST
TEST IN
TEST ENDTTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST                      5010 .........TEST
  GROUP G1
  GROUP GYES-RETEST
TEST IN
TEST ENDTTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST                      5011 .........TEST
  GROUP G1
  GROUP GYES-RETEST
TEST IN
TEST ENDTTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST                      5012 .........TEST
  GROUP G1
  GROUP GNO-RETEST
TEST IN
TEST ENDTTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST                      5013 .........TEST
  GROUP G1
  GROUP GNO-RETEST
TEST IN
TEST ENDTTTTTTTTTTTTTTTTTTTTT END OF TEST
 N TEST                      5014 .........TEST
  GROUP G1
  GROUP GYES-RETEST
TEST IN
TEST ENDS          0          0          0
 N TEST  TTTTTTTTTTTTTTTTTTTT END OF TEST
  GROUP GS          0          1          5
  GROUP G2
SUBAP UP CALLED BY ROUTINE,DOTEST

 AFTER THE DATABASE OPERATION OF INSERT

 WITH A RETURN CODE OF    18

 WITH A LEVEL NUMBER OF   18
C>
```

Figure 7. Example of SUMFLE with error

```
OLD,SUMFLE
C>LIST
 N ZONE  RANDOM1          .........ZONE
 N REPRT          82      ......... REPORT
 N TEST  YES-REPORT END DATE
0WRAP UP CALLED BY ROUTINE,DORPT

 AFTER THE DATABASE OPERATION OF GET1-2

 WITH A RETURN CODE OF     4

 WITH A LEVEL NUMBER OF    2
C>
C>OLD,DATEX3
C>
C>CME                    }CMEDIT
E>P 19

 EXAMPLE PROJECT DATA
 ZONE  RANDOM1          .........ZONE
 OLD
 RANDOM1
               82        .......  REPORT
 OLD
 8          2
 YES-REPORT END DATE
 01/22/2222
 NO-REPORT END DATE
 RRRRRRRRRRRRRRRRRRRR END OF REPORT
               3        ........ REPORT
 OLD
               82       .........TEST
 8          2
 1
 07/08/1982
 C
 99+35
 E>T
 E>N 4
               82       .......  REPORT
 E>START
 E>L /RRRRR
 RRRRRRRRRRRRRRRRRRRR END OF REPORT
 E>END
 E>REMOVE
 E>T
 E>P 10
```

```
ZONE  RANDOM1          .........ZONE
OLD
RANDOM1
               3        ........ REPORT
OLD
               82       .........TEST
8          2
1
07/08/1982
E>FILE,0
DATEX3 EDITED AND REPLACED.
C>
```

In this example, a "WRAP UP" was called because there was no previous record of report number 82. The error was made in the data entry session when report number 82 was entered as an "OLD" existing report instead of report 3. The user then continued the entry session by ending the erroneous report with an error in the date and reentering the correct data. The data file was loaded to the data base, but since there was no existing "OLD" report number 82, loading was unsuccessful. The data in file DATEX3 could not be attached to the data base and a "WRAP UP" error message resulted. The data file, DATEX3, was corrected as shown, by using a block removal under the CMEDIT (CME) mode.

Figure 8. Example of data file error correction

Table 6

Data Entry Procedure for a New Embankment Zone

Using Data File Option (Example 3)

```
GET,INPAB1
C>CALL,INPAB1


        DATA ENTRY SYSTEM FOR DAM CONSTRUCTION

 1...EMBANKMENT ZONE(INPUT END TO QUIT)?
I>RANDOM I
IS THIS A NEW ZONE? (Y OR N)

I>Y
 1...COMPACTION PERCENT?
I>95.0
 2...TYPE OF TEST?(3 CHAR. MAX)
I>SU
 3...UL LIMIT?
I>-12
 4...UR LIMIT?
I>25

     25 IS NOT WITHIN THE LIMITS: [     0.00  ,    12.00  ]
 4...UR LIMIT?
I>3
 5...S PERCENT LESS THAN 200?
I>25
 6...FIELD MOLD SIZE?
I>6

REVIEW OF INPUT
LINE #         DATA VALUE
   1 ........ 95.0
   2 ........ SU
   3 ........ -1
   4 ........ 3
   5 ........ 25
   6 ........ 6

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>3
3...UL LIMIT?
I>-6

     -6 IS NOT WITHIN THE LIMITS: [    -3.00  ,     0.00  ]
3...UL LIMIT?
I>-2

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
```

(Continued)

Table 6 (Continued)

```
1
1...COMPACTION PERCENT?
I>SU
OOPS! NOT A VALID REAL, TRY AGAIN


1...COMPACTION PERCENT?
I>99.9
   99.900 IS NOT WITHIN THE LIMITS: [    90.00  ,    98.00  ]
1...COMPACTION PERCENT?
I>95.0

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>

DO YOU WISH TO REVIEW VALUES AGAIN? (Y OR N)


I>Y

REVIEW OF INPUT
LINE #        DATA VALUE
   1 ........ 95.0
   2 ........ SU
   3 ........ -2
   4 ........ 3
   5 ........ 25
   6 ........ 6

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
 1...REPORT NUMBER(INPUT A 0 TO QUIT)?
I>1
IS THIS A NEW REPORT? (Y OR N)

I>Y
 1...BEGINNING DATE? (MM/DD/YYYY)
I>02/24/1981
 2...TYPE EQUIPMENT?(15 CHAR. MAX)
I>SHEEPFOOT ROL
 3...LOOSE LIFT THICKNESS?
I>6
 4...COMPACTED LIFT THICKNESS?
I>4
 5...NUMBER OF PASSES?
I>6
 6...LAB COMPACTION EFFORT?
I>MOD

REVIEW OF INPUT
LINE #        DATA VALUE
   1 ........ 02/24/1981
   2 ........ SHEEPFOOT ROL
   3 ........ 6
   4 ........ 4
   5 ........ 6
   6 ........ MOD

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
```

(Continued)

Table 6 (Continued)

```
 1...TEST NUMBER(INPUT A 0 TO QUIT)?
I>10001
INPUT THE TEST GROUP (1,2 OR 3)
INPUT A ZERO TO QUIT
I>1
 1...TEST DATE? (MM/DD/YYYY)
I>02/22/1981
 2...QA OR QC LAB?(1 CHAR. MAX)
I>A
 3...STATION?(6 CHAR. MAX)
I>25+00
 4...OFFSET?
I>120
 5...ELEVATION?
I>345.8
 6...DEPTH IN INCHES?
I>6
 7...MATERIAL SOURCE?(10 CHAR. MAX)
I>BORROW I
 8...SOIL CLASSIFICATION?(7 CHAR. MAX)
I>ML-CL
 9...SOIL COLOR?(4 CHAR. MAX)
I>RBR

REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ 02/22/1981
   2 ........ A
   3 ........ 25+00
   4 ........ 120
   5 ........ 345.8
   6 ........ 6
   7 ........ BORROW I
   8 ........ ML-CL
   9 ........ RBR

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
```

(Continued)

Table 6 (Continued)

```
 1...MAXIMUM PARTICLE SIZE?
I>1.75
 2...FIELD WET DENSITY?
I>134.0
 3...QUICK FIELD WATER CONTENT?
I>12.2
 4...QUICK FIELD DRY DENSITY?
I>125.1
 5...FINAL FIELD WATER CONTENT?
I>21.1
 6...FINAL FIELD DRY DENSITY?
I>124.0
 7...LABORATORY MOLD SIZE?
I>6
 8...QUICK ONE-POINT WATER CONTENT?
I>126.0
 9...QUICK ONE-POINT DRY DENSITY?
I>126.0

REVIEW OF INPUT
LINE #        DATA VALUE
   1 ........ 1.75
   2 ........ 134.0
   3 ........ 12.2
   4 ........ 125.1
   5 ........ 21.1
   6 ........ 124.0
   7 ........ 6
   8 ........ 126.0
   9 ........ 126.0

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>5
5...FINAL FIELD WATER CONTENT?
I>11.9

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>6
6...FINAL FIELD DRY DENSITY?
I>124.5

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>8
8...QUICK ONE-POINT WATER CONTENT?
I>10.3

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
```

(Continued)

Table 6 (Continued)

```
DO YOU WISH TO REVIEW VALUES AGAIN? (Y OR N)

I>Y

REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ 1.75
   2 ........ 134.0
   3 ........ 12.2
   4 ........ 125.1
   5 ........ 11.9
   6 ........ 124.5
   7 ........ 6
   8 ........ 10.3
   9 ........ 126.0

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
 1...QUICK OPTIMUM WATER CONTENT?
I>11.4
 2...QUICK MAXIMUM DRY DENSITY?
I>127.0
 3...ONE-POINT DRY DENSITY?
I>125.5
 4...ONE-POINT WATER CONTENT?
I>9.9
 5...SECOND-POINT DRY DENSITY?
I>
 6...SECOND-POINT WATER CONTENT?
I>
 7...FOC MAXIMUM DRY DENSITY?
I>126.5
 8...FOC OPTIMUM WATER CONTENT?
I>11.0
 9...QUICK % GREATER THAN 3/4"?
I>6

REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ 11.4
   2 ........ 127.0
   3 ........ 125.5
   4 ........ 9.9
   5 ........
   6 ........
   7 ........ 126.5
   8 ........ 11.0
   9 ........ 6

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
```

(Continued)

Table 6 (Continued)

```
 1...STD % GREATER THAN 3/4"?
I>8
 2...CORRECTED FOC MAXIMUM DRY DENSITY?
I>126.5
 3...CORRECTED FOC OPTIMUM WATER CONTENT?
I>11.0
 4...COMMENTS?(30 CHAR. MAX)
I>NG

REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ 8
   2 ........ 126.5
   3 ........ 11.0
   4 ........ NG

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
INPUT THE TEST GROUP (1,2 OR 3)
INPUT A ZERO TO QUIT
I>2
 1...5-POINT CURVE NUMBER?(6 CHAR. MAX)
I>R-722
 2...5-POINT MAXIMUM DRY DENSITY?
I>132.5
 3...5-POINT OPTIMUM WATER CONTENT?
I>8.5
 4...BULK SPECIFIC GRAVITY?
I>2.70
 5...ABSORPTION?
I>2.1
 6...CORRECTED 5-PT MAXIMUM DRY DENSITY?
I>132.5
 7...CORRECTED 5-PT OPTIMUM WATER CONTENT?
I>8.5

REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ R-722
   2 ........ 132.5
   3 ........ 8.5
   4 ........ 2.70
   5 ........ 2.1
   6 ........ 132.5
   7 ........ 8.5

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
```

(Continued)

Table 6 (Continued)

```
INPUT THE TEST GROUP (1,2 OR 3)
INPUT A ZERO TO QUIT
I>3
 1...SOIL CLASSIFICATION?(7 CHAR. MAX)
I>ML-CL
 2...LIQUID LIMIT?
I>34
 3...PLASTICITY INDEX?
I>18
 4...SPECIFIC GRAVITY OF SOLIDS?
I>2.68
 5...APPARENT SPECIFIC GRAVITY?
I>2.69
 6...SPECIFIC GRAVITY?
I>2.70
 7...% PASSING #200 SIEVE?
I>22
 8...% PASSING #100 SIEVE?
I>30
 9...% PASSING #40 SIEVE?
I>33

REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ ML-CL
   2 ........ 34
   3 ........ 18
   4 ........ 2.68
   5 ........ 2.69
   6 ........ 2.70
   7 ........ 22
   8 ........ 30
   9 ........ 33

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
 1...% PASSING #16 SIEVE?
I>42
 2...% PASSING #10 SIEVE?
I>49
 3...% PASSING #4  SIEVE?
I>52
 4...% PASSING 3/8" SIEVE?
I>60
 5...% PASSING 1/2" SIEVE?
I>65
 6...% PASSING 3/4" SIEVE?
I>70
 7...% PASSING 1" SIEVE?
I>
```

(Continued)

Table 6 (Concluded)

```
 8...% PASSING 1 1/2" SIEVE?
I>95
 9...% PASSING 2" SIEVE?
I>100

REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ 42
   2 ........ 49
   3 ........ 52
   4 ........ 60
   5 ........ 65
   6 ........ 70
   7 ........
   8 ........ 95
   9 ........ 100

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
 1...% PASSING 3" SIEVE?
I>100

REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ 100

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
INPUT THE TEST GROUP (1,2 OR 3)
INPUT A ZERO TO QUIT
I>0
IS THIS TEST COMPLETE?(Y OR N)
I>Y
IS THIS TEST A RETEST?(Y OR N)
I>N
 1...TEST NUMBER(INPUT A 0 TO QUIT)?
I>0
IS THIS REPORT PERIOD COMPLETED? (Y OR N)
I>N
 1...REPORT NUMBER(INPUT A 0 TO QUIT)?
I>0
IS THIS A NEW REPORT? (Y OR N)

I>N
 1...TEST NUMBER(INPUT A 0 TO QUIT)?
I>0
IS THIS REPORT PERIOD COMPLETED? (Y OR N)
I>N
 1...REPORT NUMBER(INPUT A 0 TO QUIT)?
I>0
 1...EMBANKMENT ZONE(INPUT END TO QUIT)?
I>END
DATA ENTRY TERMINATED
```

37. Example 4. This example, shown in Table 7, is identical to Example 2 but uses the just described data entry procedure. The total cost to enter this example is less than five dollars. The cost will vary according to how many tests are entered during the session and to the size of the data base.

Table 7

Data Entry Procedure for Existing Embankment Zone and Test Number Using Data File Option (Example 4)

```
GET,INPAB1
C>CALL,INPAB1


        DATA ENTRY SYSTEM FOR DAM CONSTRUCTION

 1...EMBANKMENT ZONE(INPUT END TO QUIT)?
I>RANDOM I
IS THIS A NEW ZONE? (Y OR N)

I>N
 1...REPORT NUMBER(INPUT A 0 TO QUIT)?
I>1
IS THIS A NEW REPORT? (Y OR N)

I>N
 1...TEST NUMBER(INPUT A 0 TO QUIT)?
I>10002
INPUT THE TEST GROUP (1,2 OR 3)
INPUT A ZERO TO QUIT
I>1
 1...TEST DATE? (MM/DD/YYYY)
I>02/23/1981
 2...QA OR QC LAB?(1 CHAR. MAX)
I>C
 3...STATION?(6 CHAR. MAX)
I>10+75
 4...OFFSET?
I>-1010
 5...ELEVATION?
I>352.9
 6...DEPTH IN INCHES?
I>6
 7...MATERIAL SOURCE?(10 CHAR. MAX)
I>BOR I
 8...SOIL CLASSIFICATION?(7 CHAR. MAX)
I>GC
 9...SOIL COLOR?(4 CHAR. MAX)
I>DRBN

REVIEW OF INPUT
LINE #        DATA VALUE
   1 ........ 02/23/1981
   2 ........ C
   3 ........ 10+75
   4 ........ -1010
   5 ........ 352.9
   6 ........ 6
   7 ........ BOR I
   8 ........ GC
   9 ........ DRBN

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
```

(Continued)

Table 7 (Continued)

```
 1...MAXIMUM PARTICLE SIZE?
I>2.0
 2...FIELD WET DENSITY?
I>139.0
 3...QUICK FIELD WATER CONTENT?
I>12.0
 4...QUICK FIELD DRY DENSITY?
I>128.0
 5...FINAL FIELD WATER CONTENT?
I>11.0
 6...FINAL FIELD DRY DENSITY?
I>127.0
 7...LABORATORY MOLD SIZE?
I>6
 8...QUICK ONE-POINT WATER CONTENT?
I>8.0
 9...QUICK ONE-POINT DRY DENSITY?
I>126.9

REVIEW OF INPUT
LINE #        DATA VALUE
   1 ........ 2.0
   2 ........ 139.0
   3 ........ 12.0
   4 ........ 128.0
   5 ........ 11.0
   6 ........ 127.0
   7 ........ 6
   8 ........ 8.0
   9 ........ 126.9

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
 1...QUICK OPTIMUM WATER CONTENT?
I>9.6
 2...QUICK MAXIMUM DRY DENSITY?
I>131.
 3...ONE-POINT DRY DENSITY?
I>126.0
 4...ONE-POINT WATER CONTENT?
I>7.3
 5...SECOND-POINT DRY DENSITY?
I>
 6...SECOND-POINT WATER CONTENT?
I>
 7...FOC MAXIMUM DRY DENSITY?
I>131.5
 8...FOC OPTIMUM WATER CONTENT?
I>9.0
 9...QUICK % GREATER THAN 3/4"?
I>10
```

(Continued)

Table 7 (Continued)

```
REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ 9.6
   2 ........ 131.
   3 ........ 126.0
   4 ........ 7.3
   5 ........
   6 ........
   7 ........ 131.5
   8 ........ 9.0
   9 ........ 10

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
 1...STD % GREATER THAN 3/4"?
I>13
 2...CORRECTED FOC MAXIMUM DRY DENSITY?
I>132.0
 3...CORRECTED FOC OPTIMUM WATER CONTENT?
I>8.7
 4...COMMENTS?(30 CHAR. MAX)
I>NG

REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ 13
   2 ........ 132.0
   3 ........ 8.7
   4 ........ NG

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
```

(Continued)

Table 7 (Continued)

```
INPUT THE TEST GROUP (1,2 OR 3)
INPUT A ZERO TO QUIT
I>0
IS THIS TEST COMPLETE?(Y OR N)
I>N
IS THIS TEST A RETEST?(Y OR N)
I>Y
INPUT THE ORIGINAL TEST NUMBER
I>10001
 1...TEST NUMBER(INPUT A 0 TO QUIT)?
I>10003
INPUT THE TEST GROUP (1,2 OR 3)
INPUT A ZERO TO QUIT
I>0
IS THIS TEST COMPLETE?(Y OR N)
I>N
IS THIS TEST A RETEST?(Y OR N)
I>N
 1...TEST NUMBER(INPUT A 0 TO QUIT)?
I>10002
INPUT THE TEST GROUP (1,2 OR 3)
INPUT A ZERO TO QUIT
I>3
 1...SOIL CLASSIFICATION?(7 CHAR. MAX)
I>GC
 2...LIQUID LIMIT?
I>21
 3...PLASTICITY INDEX?
I>10
 4...SPECIFIC GRAVITY OF SOLIDS?
I>2.74
 5...APPARENT SPECIFIC GRAVITY?
I>
 6...SPECIFIC GRAVITY?
I>2.72
 7...% PASSING #200 SIEVE?
I>26
 8...% PASSING #100 SIEVE?
I>30
 9...% PASSING #40 SIEVE?
I>37

REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ GC
   2 ........ 21
   3 ........ 10
   4 ........ 2.74
   5 ........
   6 ........ 2.72
   7 ........ 26
   8 ........ 30
   9 ........ 37

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
```

(Continued)

Table 7 (Continued)

```
 1...% PASSING #16 SIEVE?
I>43
 2...% PASSING #10 SIEVE?
I>50
 3...% PASSING #4  SIEVE?
I>55
 4...% PASSING 3/8" SIEVE?
I>60
 5...% PASSING 1/2" SIEVE?
I>
 6...% PASSING 3/4" SIEVE?
I>75
 7...% PASSING 1" SIEVE?
I>80
 8...% PASSING 1 1/2" SIEVE?
I>90
 9...% PASSING 2" SIEVE?
I>100

REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........ 43
   2 ........ 50
   3 ........ 55
   4 ........ 60
   5 ........
   6 ........ 75
   7 ........ 80
   8 ........ 90
   9 ........ 100

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
 1...% PASSING 3" SIEVE?
I>

REVIEW OF INPUT
LINE #          DATA VALUE
   1 ........

TO CHANGE AN ITEM, TYPE ITS LINE #
OTHERWISE HIT RETURN
I>
```

(Continued)

(Sheet 5 of 6)

Table 7 (Concluded)

```
INPUT THE TEST GROUP (1,2 OR 3)
INPUT A ZERO TO QUIT
I>0
IS THIS TEST COMPLETE?(Y OR N)
I>Y
IS THIS TEST A RETEST?(Y OR N)
I>N
 1...TEST NUMBER(INPUT A 0 TO QUIT)?
I>10001
INPUT THE TEST GROUP (1,2 OR 3)
INPUT A ZERO TO QUIT
I>0
IS THIS TEST COMPLETE?(Y OR N)
I>N
IS THIS TEST A RETEST?(Y OR N)
I>N
 1...TEST NUMBER(INPUT A 0 TO QUIT)?
I>0
IS THIS REPORT PERIOD COMPLETED? (Y OR N)
I>Y
TYPE THE REPORT END DATE (MM/DD/YYYY)?

I>02/28/1981
ARE THERE ANY NOTES FOR THIS REPORT?(Y OR N)
I>N
 1...REPORT NUMBER(INPUT A 0 TO QUIT)?
I>0
 1...EMBANKMENT ZONE(INPUT END TO QUIT)?
I>END
DATA ENTRY TERMINATED


C>
```

Interactive Data Modifications

Description

38. There are a number of commands that can either add or modify data when the user is working on line with the data base. Of these, there are three commands that the user of this data base system should be aware of; they are ADD, CHANGE, and REMOVE. Each of these commands will be described in detail with additional examples shown at the end of this Part. These three commands deal with adding to or modifying existing data groups; if the user wants to insert new data groups, he should either use the data entry program or refer to the System 2000 documentation. The data base can be damaged in this interactive mode and a backup copy is recommended (see Appendix E). Before using these commands, the user must understand the WHERE-clause information discussed in Part IV because each of these commands will modify or add data as specified; thus each command must uniquely identify the data set (embankment zone, report period, or test number) so that only the intended data is changed. After each command is executed, the computer will respond with the number of selected data sets that were modified. If more data sets are involved than the user expected, he needs to determine what else was modified so that corrective measures can be performed.

a. ADD command. The ADD command is used to add one or several elements of data to an existing data group where no data presently exists. This command is used when a few elements of data need to be added to a data group. In Example 1 (the last line on sheet 8 of Table 4), no value was entered for the "% passing 1" SIEVE" (GR1I) in test number (NO.) 10001. The data were loaded to the data base before the user realized that the "% passing 1" SIEVE" (GR1I) should be equal to 75. To add this value the user must be on line with the data base and issue the add command:

```
ADD GR1I EQ 75*WHERE NO. EQ 10001;
```

Computer response of:

```
1 SELECTED DATA SET
```

indicates that the value was added to the data base. Test number (NO.) 10001 is the specifier in the where clause, since it identifies a unique place in the data base for the 75% passing 1" sieve.

Some typical examples of the ADD command are:

```
ADD ELE EQ 350.0*WHERE NO EQ 10112;

ADD C71 EQ 350.0*WHERE C61 EQ 10112;

ADD LLT EQ 6*WHERE C21 EQ RANDOM I AND REPORT-NO
EQ 20;

ADD TESTS EQ 63*U*67*24+50*END*WHERE C61 EQ 10113;
```

The data element names and component numbers are defined in Table 1. All data base commands must end with a semicolon (;) and the asterisk (*) is the system separator. The equal operation (EQ) is the only valid operator for the add command. The second command, using the data element names, will add the number 350.0 as the elevation to test number 10112, provided that there is not an elevation existing for that test. If an elevation did exist for test 10112, nothing would have been added and the system would tell the user zero data sets were selected. The second command is the same as the first, only the component numbers are used instead of the element name. The first three commands were identified by the unique test number. However, the fourth command, adding the loose lift thickness to the report information, must be identified by both embankment zone and report number. The last command illustrates adding two elements to the same test number. Both elements are located in the TESTS repeating group and are component numbers 63 and 67, where 63 equals U and 67 equals 24+70. When multiple elements are added, the word "END*" must appear after the last value to be added; otherwise the command will not be accepted. Multiple elements that are not in the same repeating group cannot be added in the same command.

b. CHANGE command. The CHANGE command is used to modify one or several existing data element values. This command is used to correct errors that are found in the data base. Two examples of the CHANGE command are:

```
CHANGE ELE EQ 351.0*WHERE NO EQ 10001;

CHANGE TESTS EQ 67*25+40*71*350.0*END*WHERE NO
EQ 10112;
```

All the nomenclature is defined in Table 1 or for the ADD command. The value after the equal is always the corrected value. The first command will change the elevation from 345.8 (Example 1, page 3) to 351.0 for test 10001. The second command will change the station (C67), and elevation (C71), for test 10112. All the details of the CHANGE command are the same as the ADD command.

c. REMOVE command. The purpose of the REMOVE command is to delete data from the data base. The user is reminded of the importance of uniquely defining the data to be removed so that other data are not lost. An example of the REMOVE command is:

```
REMOVE END-DATE WHERE C21 EQ RANDOM I AND
C35 EQ 20;
```

The nomenclature has been previously defined. This example removes the end date of report 20 of Random I from the data base. Multiple data elements cannot be removed by using one command; however, one of the following examples illustrates how a complete test is removed.

Examples

39. The following examples illustrate some typical uses of the ADD, CHANGE, and REMOVE commands.

a. ADD command. When data is entered to the data base by one of the first two procedures described in this Part, several data elements will invariably be missing. These values are entered into the data base with the ADD command as the following examples illustrate. These examples include not only the user-entered command but also the computer response.

(1) Adding the liquid limit for test number 10112. The user is reminded that if the test numbers are not unique for the entire project, both the embankment zone and test number may be needed to uniquely identify the test number for which the liquid limit is being added.

```
I >ADD LL EQ 25* WHERE NO EQ 10112;
    -       1 SELECTED DATA SETS -
    ---
```

(2) Adding the specific gravity (C148), specific gravity of solids (C145), apparent specific gravity (C146), and bulk specific gravity (C147) for test number 10112. The element component number must be used when adding more than one element at a time.

```
I >ADD TESTS EQ 148*2.70*145*2.72*146*2.68*147*2.65*
    ---
I >END* WHERE NO EQ 10112;
    -       1 SELECTED DATA SETS -
    ---
```

(3) Adding the maximum dry density (C107) and the percent compaction (C113) for test number (C61) 10112. The user is reminded that the percent compaction and deviation from optimum water content are not calculated if one of the elements needed in the calculation is added with this command.

```
I>ADD TESTS EQ 107*130.2*113*98.1*END*

---

I>WHERE C61 EQ 10112;

-      1 SELECTED DATA SETS -

---
```

b. CHANGE command. When the wrong data values are entered into the data base, the CHANGE command is used to correct the values. The following examples include not only the user-entered commands (lines beginning with I>) but also the computer response.

(1) Changing the liquid limit for test number 10112 from 25 to 27. The user is reminded that only the correct value is used in the command.

```
I>CHANGE LL EQ 27* WHERE NO EQ 10112;

-      SELECTED DATA SETS -

---
```

If the user attempts to change a value that is the same as the existing value, the data base will be unaltered as shown.

```
I>CHANGE LL EQ 25* WHERE NO EQ 10112;

-      1 SELECTED DATA SETS -

- DATA BASE UNALTERED -

---
```

(2) Changing the maximum dry density and the percent compaction for test number 10112 from what was added in subparagraph a(3) to a maximum dry density of 131.8 pcf and a percent compaction of 99.0 percent.

```
I>CHANGE TESTS EQ 107*131.8*113*99.0*END*

---

I>WHERE NO EQ 10112;

-      1 SELECTED DATA SETS -

---
```

c. REMOVE command. This command is used when a data element was erroneously added to a test number, or if a large number of data values are wrong, the user may remove the test number and reenter the data with one of the procedures described in the beginning of this Part.

(1) Removing the liquid limit value for test number 10112. The user is reminded that the data to be removed must be uniquely identified.

```
I>REMOVE LL WHERE NO EQ 10112;

    -       1 SELECTED DATA SETS -

    ---
```

(2) Removing test number 10112 from the data base.

```
I>REMOVE TREE TESTS WHERE NO EQ 10112;

    -       1 SELECTED DATA SETS -

    ---
```

The word "TREE" followed by C60 (tests) represents the whole test group from C61 to C163. However, the command:

```
I>REMOVE C61 WHERE C61 EQ 10112;
```

would only delete C61, test number 10112.

PART IV: DATA OUTPUT MODULE

40. There are three methods of retrieving data from the data base and one procedure to obtain graphic plots from this system. The three methods of retrieving data from the data base are: ad hoc, report writer, and program language extension (PLEX). The ad hoc retrievals are done interactively with the data base by asking questions using the built-in system query language. This is the simplest and most flexible of the three retrievals because the user asks for the information he wants during the time-sharing session. Each query or question requires a scan of the data base files. The report writer retrievals provide the user with the capability to define and generate formulated reports from a single scan of the data base files. The reports can be developed interactively while using System 2000 (expensive) or separately from the data base using GENIUS (page 90) to quickly build a file that is invoked when using the data base. The report writer requires the user to have some knowledge of the data base query language plus the report writer features. The PLEX retrievals are FORTRAN programs that interface with the data base to gather the data required by the program. Some computer programming experience is required to generate these programs, but once the programs are written, they are easy to use. The graphic procedure consists of using either a series of ad hoc retrievals or a report writer file to create a data file that is accessed by the graphic program. In any retrieval, "--SHARED DBN IS---" should be used to open the data base for read only and prevent accidental damage. This form also allows other users to read the data base at the same time. The next four sections of this part will describe each of the retrieval methods and the graphic procedure with examples illustrated both in the text and with a separate heading at the end of each section which will include some examples with the system response. The costs for the various retrieval methods will be dependent on what is to be requested (the number of times the system must search its files for data), the data base size, and other user-dependent variables. The costs to generate the examples will be included in the example descriptions.

41. System 2000 allows commands to be entered on multiple lines from the user's time-sharing terminal. All data base commands must end in a semicolon (;). The system will not execute any command until the semicolon is encountered. If multiple lines are used to input a command, always type a space at the beginning of each line.

42. When the user has finished working in the data base, the following command will close the data base and allow the user to leave the data base:

```
EXIT;
```

If this command does not work the first time, the following will always work:

```
; EXIT;
```

If a query or command produces an unwanted listing, the user can sometimes stop the printing by using the "Break" or "Interrupt" key on the terminal.

Output Files

43. Sometimes the user would like to save some of the data base output in the computer files for future analysis or reference. This can be done by directing the output to a file. This feature of the data base is very important when the user wants to generate graphic plots. In addition, if the user is using this data in a report or for analysis, it would be desirable for the commands used to generate the data to be available. The following discussion describes how the output and commands can be saved in files.

a. Report files. Normally the Report File, which will contain the results from the user's queries, is assigned to OUTPUT, which is the user's teletype terminal. However, the user can assign the results to an OUTPUT File which can then be saved. The following sequence of commands are used:

```
REPORT FILE IS OUT1;
"Ad Hoc Retrieval or Report Writer Commands"
REPORT FILE IS OUTPUT;
```

In this example the ad hoc retrieval or report writer output would be sent to file OUT1. The last statement returns the output to the user's terminal for any other commands. After the user has exited from the data base, the following command is used to make the output file permanent:

SAVE,OUT1

The file OUT1 is then accessed like any other file on the BCS.

b. Message file. This file contains a list of the user commands and any error messages that result from those commands. A file name can be assigned to this file just like the Report File above. Initially this file is set to OUTPUT each time the user starts a data base session. An example of this comand is:

MESSAGE FILE IS LIST1;

The user can assign the MESSAGE FILE to the same file name as the REPORT FILE to document the queries that are listed. An example of this procedure is:

REPORT FILE IS OUT2;

MESSAGE FILE IS OUT2;

"Ad Hoc Retrieval or Report Writer Commands"

REPORT FILE IS OUTPUT;

Ad Hoc Retrievals

Description

44. The ad hoc query retrievals are designed to allow the user to browse or retrieve data. These retrievals are generally simple requests that the user initiates during a time-sharing session. Some requests can become complicated with titles and paging information, but the costs of these requests generally dictates that the report writer be used. To facilitate the ad hoc feature of the data base, a query language has been developed that contains certain commands, clauses, and operators the data base understands. The following discussion of the query language is not an exhaustive reference, but various components are described that are used with this particular data base so that a user can interrogate this system. The user is referred to the System 2000 QUEST

Manual (Intel Systems Corporation 1981) for more detailed information on the query language. All data base element names and component numbers used in the example in this section are described in Table 1.

a. PRINT command. The PRINT command allows the user to print any data from the data base in a sequential vertical list. Two examples would be:

```
PRINT ZONES;

PRINT ZONES WHERE EMBANK ZONE EQ RANDOM I;
```

The first request will print all the data for all zones, while the second request will print all the data for just Random I zone. Besides requesting repeating groups, individual data elements (identified by data element name or component number) can be used as the following example shows:

```
PRINT NO, C65, PC, DOWC WHERE EMBANK ZONE EQ
   RANDOM I AND C65 EQ 08/13/1981;
```

This example would print the test number, date made, percent compaction, and deviation from optimum water content for all the tests made on 08/13/1981 for Random I zone. The print command lists one data item with the data base component number per line. The data element name can be printed instead of the component number by using NAME as shown in the following example which produces the same result as the previous example except that the element names are printed with the results instead of the component number:

```
PRINT/NAME/NO,C65,PC,DOWC WHERE EMBANK ZONE EQ
    RANDOM I AND C65 EQ 08/13/1981;
```

Print statements can be used with any correct WHERE clause, ORDERING clause, and BY lists, examples of which will be shown when they are described later in this section.

b. LIST command. The LIST command is similar to the print command except that the data values are spread across the page in a tabular format with the data element name at the top of each column. Several examples of list commands are:

```
LIST EMBANK-ZONE, REPORT-NO., BEGIN-DATE, END-DATE;

LIST REPORT-NO., BEGIN-DATE, END-DATE WHERE EMBANK-
   ZONE EQ RANDOM I;

LIST C55, C41, C43 WHERE C21 EQ RANDOM I;

LIST REPORT-NO., C41, C43 WHERE C21 EQ RANDOM I;
```

The first example request would list all the indicated data for all embankment zones, while the second example would list the data for only RANDOM I zone. The output from the second, third, and fourth examples are the same. The third example shows that component numbers can be used instead of data element names. Component numbers and data element names can be mixed within the same command as the fourth example illustrates. As with the print command, the list command can be used with WHERE clauses, ORDERINC clauses, and BY lists, examples of which will be shown when they are described later in this section. In addition, with the list command, titles, page headings, and footnotes can be added to the output along with formatting where the data are located on the page. These options dealing with page formatting will be described in the paragraph "Formatted list commands."

c. WHERE clauses. The WHERE clause is used to specify the data set that the user is interested in obtaining. These clauses consist of a series of phrases that contain either the component number or element name, an operator, and the value or condition. The following are examples of the different types of operators that are available:

```
LIST NO WHERE USE FAILS; (does not have a value)

LIST NO WHERE USE EXISTS; (has a value)

LIST NO WHERE PC GT 99.0; (percent compaction greater
   than 99.0)

LIST NO WHERE PC GE 99.0; (percent compaction greater
   than or equal to 99.0)

LIST NO WHERE PC LT 99.0; (percent compaction less
   than 99.0)

LIST NO WHERE PC LE 99.0; (percent compaction less
   than or equal to 99.0)

LIST NO WHERE PC EQ 99.0; (percent compaction equal
   to 99.0)

LIST NO WHERE PC NE 99.0; (percent compaction is not
   equal to 99.0)

LIST NO WHERE PC SPANS 95.0* 99.0; (percent compaction
   is equal to 95.0 thru 99.0)

LIST NO WHERE PC EQ 95.0* 99.0; (percent compaction is
   equal to 95.0 thru 99.0)

LIST NO WHERE PC NE 95.0* 99.0; (percent compaction is
   not equal to 95.0 thru 99.0)
```

WHERE clauses can be combined using AND and OR connectors and using parentheses to group conditions for clarity.

This gives the user the capability to ask some complex questions as the following example indicates:

```
LIST NO WHERE C21 EQ RANDOM I and C55 EQ 20 AND
   (PC NE 95.0* 99.0 OR DOWC NE -1.0* 2.0);
```

When using WHERE clauses, the user must ensure the variables in the clause are KEY variables and that they are in the same repeating group as the variables in the LIST or PRINT command.

d. System function. In addition to listing (or printing) the data elements themselves, System 2000 can generate the following statistical information:

COUNT(PC) - count how many percent compaction values exist

MIN(PC) - determine the minimum percent compaction

MAX(PC) - determine the maximum percent compaction

AVG(PC) - determine the average of the percent compaction values

SUM(PC) - generate the summation of the percent compaction values

SIGMA(PC) - generate the standard deviation of the percent compaction

These functions can only be used in the LIST or PRINT commands as the following example illustrates, not in a WHERE clause.

```
LIST COUNT(PC), SUM(PC), AVG(PC), MIN(PC), MAX(PC),
    SIGMA(PC) WHERE C21 EQ RANDOM I AND C55 EQ 20 AND
    USE FAILS;
```

e. DITTO command. After successfully typing a long query and obtaining the desired results, the user would like the same information for a different WHERE-clause condition. The DITTO command causes the previous command on the left of the WHERE-clause to be reused. Using the example in d, the user would enter the following to obtain the same information for report number 21:

```
DITTO WHERE C21 EQ RANDOM I AND C55 EQ21 AND USE FAILS;
```

f. SAME command. The SAME command does the same as the DITTO command except that it works on the right side of the WHERE clause. The following example illustrates this command:

```
LIST NO WHERE C21 EQ RANDOM I AND C55 EQ 20 AND ELE
    EQ 350.* 360. AND USE FAILS;

LIST STA,OFT WHERE SAME;
```

Both the DITTO and SAME commands can be combined in the same LIST or PRINT command. When this occurs, the report is duplicated. This may be useful if some printout was lost due to transmission error or some other problem. Also the SAME command has an additive capability; thus the user can narrow data of interest as shown in the following example:

```
LIST NO WHERE C21 EQ RANDOM I AND C55 EQ 20 AND USE
    EXISTS;

LIST NO WHERE SAME AND ELE EQ 350.* 360.;

DITTO WHERE SAME AND OFT GE 0.0;
```

The first example defines the data group to a zone, a report number, and to failing tests. The second query further narrows the data group to between elevation 350 and 360. The last query refines the data group to only the upstream tests. If the OR connectors are used instead of the AND connectors, the data group can be enlarged.

g. TALLY command. The TALLY command is used to obtain certain basic information on KEY data elements. There are two types of TALLY commands, ALL and EACH. The following information can be obtained for each of these types:

A) MAXIMUM AND MINIMUM VALUES OF REQUESTED ELEMENT (/ALL/)

B) NUMBER OF OCCURRENCES OF THE ELEMENTS REQUESTED ELEMENT (/ALL/)

C) NUMBER OF UNIQUE VALUES OF THE ELEMENTS REQUESTED ELEMENT (/ALL/)

D) THE UNIQUE VALUES FOR REQUESTED ELEMENT (/EACH/)

E) THE NUMBER OF OCCURRENCES OF EACH UNIQUE VALUE FOR REQUESTED ELEMENT (/EACH/)

The following examples illustrate the two types of TALLY commands:

```
TALLY/ALL/NO;

TALLY/EACH/USE;
```

WHERE-clauses are not allowed in a TALLY command.

Some System 2000 data bases have a TALLY function associated with the system. This function operates the same as the system TALLY except WHERE-clause conditions can be specified. The example illustrates this function:

```
*TALLY(NO) WHERE C21 EQ RANDOM I;
```

h. DESCRIBE command. The DESCRIBE command will print the System 2000 directory of data elements. Component numbers

and element names are listed along with some other attributes that are listed in Table 1. The command to list the entire data base is illustrated below:

```
DESCRIBE;
```

To list only part of the data base, the following command would be used:

```
DESCRIBE C60 THRU C80;
```

i. Ordering statements. The ORDERED BY clause allows the user to sequence the output in ascending (low) or descending (high) order according to data elements associated with the record. Ascending order is assumed. For example:

```
LIST NO, STA, OFT, ELE, ORDERED BY STA, OFT WHERE
    C21 EQ RANDOM I;
```

will list in increasing order for station numbers and where two or more tests have the same station number, in increasing order for offset. If descending order is desired, it is recommended that the HIGH and LOW modifiers be attached in front of each data element as shown below.

```
LIST NO, STA, OFT, ELE, ORDERED BY HIGH STA, LOW OFT
    WHERE ...;
```

The ORDERED BY clause can also be used in the PRINT command:

```
PRINT NO, STA, OFT, ELE, ORDERED BY HIGH STA, LOW OFT,
    WHERE ...;
```

There must be a comma between the list of data elements and the ORDERED BY clause. NON-KEY data elements cannot be specified in ordered statements.

j. Abbreviations. System 2000 allows users to use a number of abbreviations and shorthand notations to simplify their queries. The valid abbreviations are:

```
TA  = TALLY
LI  = LIST
PR  = PRINT
WH  = WHERE
OB =  ORDERED BY
DI  = DITTO
SA  = SAME
```

k. Formatted LIST command. The LIST command can allow you to list information in many different ways by using the TITLE options. These options would generally be used for

reports that require sorted lists of various information from the data base. Three options can be defined in the TITLE clause. These options are:

(1) D(NN)TEXT - ADD A REPORT HEADING AT THE TOP OF THE REPORT. THE CURRENT DATE WILL BE CENTERED UNDER THE 'TEXT' HEADING. NOTE: DO NOT USE ANY COMMAS (',') IN YOUR HEADING.

(2) F(MM)TEXT - ADD A REPORT FOOTING AT THE BOTTOM OF EACH PAGE AND SPECIFY A PAGE SIZE.

(3) COLUMN-HEADERS - MODIFY THE HEADERS ON EACH COLUMN OF OUTPUT TO PRINT MULTI-LINE, USER-SPECIFIED COLUMN HEADERS INSTEAD OF DATA ELEMENT NAMES. THE USER WILL NEED TO REFER TO THE FULL SYSTEM 2000 DOCUMENTATION FOR DETAILS ABOUT THIS OPTION.

The following examples illustrate the page heading and footnote options:

LIST/TITLE D(NN)TEST/ ...;

LIST/TITLE F(MM)TEXT/ ...;

D(NN) indicates you want a descriptive heading at the top of the page. The current date will be printed centered under your text heading. If the TEXT is blank, only the date will be printed. The value NN is the starting position (in characters from the left) of the beginning character of TEXT. F(MM) without TEXT defines a page size of MM (try 55). The TEXT will be printed following one blank line at the bottom of each page and will start in the leftmost print column. A bug in System 2000 causes the first character of the footing not to print. Use a decimal (.) as the first character and there will be no problems. Headings, footings, and column-headers can be combined in one list command.

Example 5

45. The following data base session, shown in Table 8 as Example 5, illustrates some of the data sets selected by the ad hoc retrievals discussed earlier. To limit the amount of output generated, some of the WHERE clauses are more restrictive in this example than shown in the description. The three commands used to access the data base are shown at the beginning of the example. These commands can be put into a user-named file for ease of use. This session accessed the Warm Springs Dam data base and cost about twenty dollars.

Table 8

Data Base Ad Hoc Retrievals (Example 5)

```
C>GET,S2KGET/UN=CECE2K
C>CALL,S2KGET
 11.54.10.  S2KGET(CORPS)
*
C>S2K
 82/03/22. 11.54.14. BEGIN SYSTEM 2000  VERSION 2.60F
 ---
I>USER,EVE;SHARED DBN  IS SOILDB;
 -556-   ASSIGNED   SOILDB                    16  3853 82/03/22. 11.24.38.
 ---
I>PRINT EMBANK-ZONE;
     21* I.C.MAIN DAM
     21* I.C. COFFER
     21* FILTER
     21* DRAIN
     21* RANDOM II
     21* RANDOM III
     21* O.W.S&G BAK
     21* O.W.DRAIN
     21* O.W.BAK RAD
     21* O.W.D&FH EMB
     21* SPLW BAK-RAD
     21* EXPLO TESTS
     21* SPLW DRAIN
     21* ROAD EMB
     21* RANDOM I
     21* DRAIN DITCH
     21* RECORD R-I
     21* DRAIN DITCH
     21* RECORD I.C.
     21* RECORD R-II
   ---

I>PRINT NO,C65,PC,DOWC WHERE EMBANK-ZONE EQ RANDOM I
 ---
I>AND C65 EQ 08/13/1981;
       61*  13026
       65* 08/13/1981
       113*  94.9
       111*  1.0
       61*  13021
       65* 08/13/1981
       113*  96.2
       111* -0.2
       61*  13022
       65* 08/13/1981
       113* 102.0
       111* -0.9
       61*  13020
       65* 08/13/1981
       113*  98.9
       111*  0.5
       61*  13023
       65* 08/13/1981
       113*  98.0
       111* -0.6
       61*  13024
       65* 08/13/1981
       113* 101.6
       111* -0.8
       61*  13027
```

(Continued)

Table 8 (Continued)

```
        65% 08/13/1981
        113%  99.5
        111%  1.0
        61%  13028
        65% 08/13/1981
        113% 103.3
        111% -0.2
        61%  13025
        65% 08/13/1981
        113%  94.4
        111%  0.9
 ---


I>PRINT/NAME/NO,C65,PC,DOWC WHERE EMBANK-ZONE EQ RANDOM I
  ---
I>AND C65 EQ 08/13/1981;
        NO%  13026
        DATE-MADE% 08/13/1981
        PC%  94.9
        DOWC%  1.0
        NO%  13021
        DATE-MADE% 08/13/1981
        PC%  96.2
        DOWC% -0.2
        NO%  13022
        DATE-MADE% 08/13/1981
        PC% 102.0
        DOWC% -0.9
        NO%  13020
        DATE-MADE% 08/13/1981
        PC%  98.9
        DOWC%  0.5
        NO%  13023
        DATE-MADE% 08/13/1981
        PC%  98.0
        DOWC% -0.6
        NO%  13024
        DATE-MADE% 08/13/1981
        PC% 101.6
        DOWC% -0.8
        NO%  13027  D
        DATE-MADE% 08/13/1981
        PC%  99.5
        DOWC%  1.0
        NO%  13028
        DATE-MADE% 08/13/1981
        PC% 103.3
        DOWC% -0.2
        NO%  13025
        DATE-MADE% 08/13/1981
        PC%  94.4
        DOWC%  0.9
```

(Continued)

Table 8 (Continued)

```
I>LIST EMBANK-ZONE;
   EMBANK-ZONE
 ***
 * I.C.MAIN DAM
 * I.C. COFFER
 * FILTER
 * DRAIN
 * RANDOM II
 * RANDOM III
 * O.W.S&G BAK
 * O.W.DRAIN
 * O.W.BAK RAD
 * O.W.D&FH EMB
 * SPLW BAK-RAD
 * EXPLO TESTS
 * SPLW DRAIN
 * ROAD EMB
 * RANDOM I
 * DRAIN DITCH
 * RECORD R-I
 * DRAIN DITCH
 * RECORD I.C.
 * RECORD R-II
 ---

I>LIST NO,C65,PC,DOWC WHERE EMBANK-ZONE EQ RANDOM I
 ---
I>AND C65 EQ 08/13/1981;
          NO     DATE-MADE          PC      DOWC
 ***
 *     13026    08/13/1981        94.9       1.0
 *     13021    08/13/1981        96.2      -0.2
 *     13022    08/13/1981       102.0      -0.9
 *     13020    08/13/1981        98.9       0.5
 *     13023    08/13/1981        98.0      -0.6
 *     13024    08/13/1981       101.6      -0.8
 *     13027    08/13/1981        99.5       1.0
 *     13028    08/13/1981       103.3      -0.2
 *     13025    08/13/1981        94.4       0.9
 ---

I>LIST NO,C65,PC WHERE C21 EQ RANDOM I AND
 ---
I>C65 SPANS 07/01/1981* 08/01/1981 AND PC EQ 97.* 98.;
          NO     DATE-MADE          PC
 ***
 *     12861    07/01/1981        97.4
 *     12866    07/02/1981        97.9
 *     12869    07/07/1981        97.9
 *     12873    07/08/1981        97.3
 *     12879    07/09/1981        97.2
 *     12886    07/11/1981        98.0
 *     12887    07/10/1981        97.9
 *     12902    07/17/1981        97.7
 *     12912    07/20/1981        97.8
 *     12932    07/23/1981        97.9
 *     12934    07/23/1981        97.4
 *     12942    07/24/1981        97.8
 *     12941    07/24/1981        97.4
 *     12961    07/29/1981        97.1
 ---
I>
```

(Continued)

Table 8 (Continued)

```
I>LIST NO,PC,DOWC WHERE C21 EQ RANDOM I AND C55 EQ 20
I>AND (PC NE 95.0* 99.0 OR DOWC NE -1.0* 2.0);
          NO          PC        DOWC
 ***
 *     10491        98.0        -1.4
 *     10492        99.1         1.2
 *     10493        98.4         2.7
 *     10494       104.7         0.4
 *     10495       101.2         3.1
 *     10496        93.5         1.6
 *     10497        93.1         0.8
 *     10498        83.9         2.5
 *     10499        88.9         2.6
 *     10501       103.4         1.9
 *     10502       101.1         0.3
 *     10503       100.2        -1.1
 *     10504       102.1        -1.9
 *     10505       100.2         3.1
 *     10506       103.5        -0.2
 *     10507        99.3         1.4
 *     10510        97.5        -1.8
 *     10511        95.3         3.2
 *     10514        94.2         1.0
 *     10516        92.6         0.4
 *     10518        99.6        -1.7
 *     10519       103.2         2.8
 *     10520       100.1         0.9
 *     10522        99.4        -0.2
 *     10523        98.3        -1.6
 *     10525        95.3         2.4
 *     10526        93.0        -0.3
 *     10527        88.6         1.4
 *     10528        97.5         3.6
 *     10529        97.1         3.1
 *     10530        99.1        -0.5
 *     10531       102.5         0.0
 *     10533        92.6         5.4
 *     10534        98.7         2.4
 *     10536        99.6         0.2
 *     10537        95.8         2.4
 *     10539        94.2        -3.1
 *     10541        96.1         2.9
 *     10542        86.2         0.9
 ---
I>

LIST COUNT(PC),SUM(PC),AVG(PC),MIN(PC),MAX(PC),SIGMA(PC)
I>WHERE C21 EQ RANDOM I AND C55 EQ 20 AND USE FAILS;
 ***
 *        46        4512.200        98.091        92.600        104.700        2.926
 ---
I>DITTO WHERE C21 EQ RANDOM I AND C55 EQ 21 AND USE FAILS;
 ***
 *        36        3538.700        98.297        86.200        109.100        4.208
 ---
```

(Continued)

Table 8 (Continued)

```
I>LIST NO,ELE,OFT WHERE C21 EQ RANDOM I AND C55 EQ 20 AND USE FAIL
I>LIST NO,ELE,OFT WHERE C21 EQ RANDOM I AND C55 EQ 20 AND USE EXISTS;
          NO          ELE         OFT
 ***
 *    10496       201.1        243
 *    10498       206.0        289
 *    10499       206.0        256
 *    10526       214.5        256
 *    10527       210.0        543
 *    10542       217.0        279
 ---
I>DITTO WHERE SAME AND ELE EQ 210.*220.;
          NO          ELE         OFT
 ***
 *    10526       214.5        256
 *    10527       210.0        543
 *    10542       217.0        279
 ---
I>DITTO WHERE SAME AND OFT GE 275.;
 ..............................C
 -308- ERROR IN DATE OR NUMERIC ELEMENT VALUE-
 ---
I>DITTO WHERE SAME AND OFT GE 275;
          NO          ELE         OFT
 ***
 *    10527       210.0        543
 *    10542       217.0        279
 ---
I>



I>TALLY/ALL/NO;
 **************************
  ELEMENT-      NO
 **************************
  MINIMUM-       10000
 ------------------------
  MAXIMUM-       44019
 ------------------------
     6111  UNIQUE VALUES
 ------------------------
     6113  OCCURRENCES
 ------------------------
 ---
I>TALLY/EACH/USE;
 ************************
  ELEMENT-      USE
 ************************
 FREQUENCY    VALUE
 ------------------------
      115       C
      151       R
       16       S
      897       U
      134       V
       67       W
 ------------------------
        6  UNIQUE VALUES
 ------------------------
     1380  OCCURRENCES
 ------------------------
 ---
I>
```

(Continued)

Table 8 (Continued)

```
DESCRIBE C60 THRU C79;
        60%  TESTS (RG IN 40)
          61%  NO (INTEGER NUMBER 9(6) IN 60)
          62%  TC (NAME X IN 60)
          63%  USE (NAME X IN 60)
          65%  DATE-MADE (DATE IN 60)
          66%  LAB (NAME X IN 60)
          67%  STA (NAME X(6) IN 60)
          69%  OFT (INTEGER NUMBER 9(5) IN 60)
          71%  ELE (DECIMAL NUMBER 9999.9 IN 60)
          73%  DEP (INTEGER NUMBER 99 IN 60)
          75%  MS (NAME X(10) IN 60)
          76%  FWD (DECIMAL NUMBER 999.9 IN 60)
          77%  FDD (DECIMAL NUMBER 999.9 IN 60)
          79%  FWC (DECIMAL NUMBER 99.9 IN 60)
 ---
I>
```

(Continued)

Table 8 (Concluded)

```
I>LIST NO,STA,OFT,ELE,ORDERED BY STA,LOW OFT
 ---
I>WHERE C21 EQ RANDOM I AND C55 EQ 20;
          NO    STA            OFT         ELE
 ***
 *     10524    16+90          304       197.2
 *     10538    17+04          302       202.3
 *     10526    18+25          256       214.5
 *     10499    18+25          256       206.0
 *     10503    18+25          256       206.0
 *     10533    18+25          256       214.5
 *     10508    18+26          516       201.0
 *     10525    18+35          450       209.7
 *     10517    18+37          310       208.1
 *     10494    18+50          285       202.7
 *     10539    18+64          688       216.0
 *     10530    18+65          249       212.0
 *     10513    18+74          736       208.4
 *     10520    18+75          259       211.6
 *     10507    18+75          259       207.0
 *     10516    18+75          520       208.0
 *     10506    18+90          559       202.5
 *     10532    18+90          601       211.1
 *     10521    19+15          265       209.5
 *     10534    19+41          637       210.9
 *     10496    19+44          243       201.1
 *     10502    19+44          243       201.0
 *     10531    19+50          132       209.0
 *     10492    19+64          334       202.5
 *     10514    19+66          487       206.0
 *     10536    19+70          256       213.4
 *     10491    19+84          220       200.5
 *     10519    20+01          582       210.0
 *     10523    20+52          528       208.7
 *     10501    20+66          529       202.0
 *     10495    20+74          279       205.0
 *     10542    20+74          279       217.0
 *     10515    20+74          279       210.0
 *     10528    20+74          322       210.0
 *     10518    20+75          264       208.8
 *     10509    20+76          543       205.0
 *     10511    20+76          543       205.0
 *     10527    20+76          543       210.0
 *     10537    20+76          543       213.0
 *     10535    20+76          582       210.7
 *     10493    21+00          409       202.0
 *     10529    21+16          196       210.0
 *     10522    21+20          280       210.4
 *     10510    21+23          214       206.5
 *     10498    21+49          289       206.0
 *     10512    21+49          289       209.0
 *     10540    21+49          289       214.0
 *     10504    21+49          289       206.0
 *     10541    21+50          553       216.0
 *     10505    22+00          443       193.5
 *     10500    22+45          225       202.0
 *     10497    22+50          560       202.5
 ---
I>

EXIT
I>EXIT;
 -506-    CLOSED     SOILDB                  16  3853 82/03/22. 11.24.38.
 82/03/22. 13.14.57. END   SYSTEM 2000  VERSION 2.60F
STOP S2K
```

Report Writer Retrievals

Description

46. After the user becomes familiar with the ad hoc retrievals, there are many results or data groupings the user would like to generate. Using the procedures in the previous paragraph would be cumbersome if standard commands would have to be entered each time the same type of result is needed for a different group of data. The report writer feature of the data base was designed to generate frequently used output formats. The report writer will generate a set format and allow the user to select the data group of interest. The data base files are scanned once for each report; whereas, the files are scanned for each interactive command.

47. Use of the report writer. This section describes the use of the report writer feature and the various formats or reports that are available. The user is referred to the System 2000 GENIUS program (GET,GENIUS/UN=CECE2K; GENIUS and USE OPTIONS 88 and 89) for easy preparation of a report writer file. (For GENIUS manual, contact Mr. Walter Hart, DAEN-RMI, FTS 272-0280.)

a. File availability. All files on Boeing Computer System are stored on disks; thus any file the user accesses must be put in the user's work space. To put files in this work space, the computer must "GET" the files from the disk storage. There are two methods for the user to put files in the work space. The first method is to have frequently used files obtained in the command file that accesses the data base. This way, every time the data base is accessed, these report writer files are available for use. An example of this method is shown below in the listing of the file CMP:

```
GET,S2KGET/UN=CECELB
GET,FDDH/UN=CERØK2
GET,FWCH/UN=CERØK2
CALL,S2KGET
S2K
```

This file will put report writer files FDDH, and FWCH in the user's work space along with accessing the data base. Generally these command files are generated for each project; however, the names are defined by the users for

each project. The second method of putting files in the user's work space is to issue a GET command before the data base command file is executed. An example of this procedure is:

```
GET,PCH/UN=CERØK2
GET,CMD
CALL,CMD
```

This example would put the file PCH in the user's work space along with any files listed in CMD.

b. Report generation. When the user is working interactively with the data base, the system is initially reading all commands from the terminal which is considered INPUT. If the user wants to have the data base read commands from a file, the following command is used:

```
COMMAND FILE IS (file name);
```

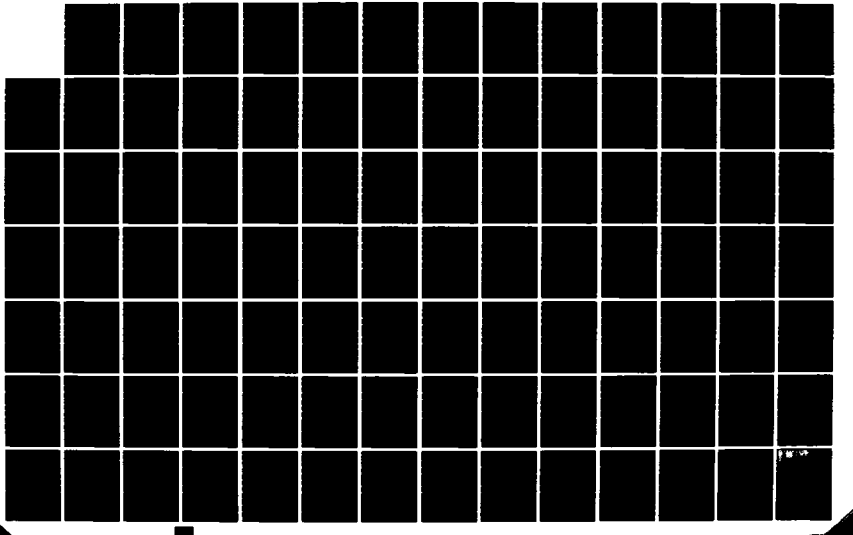
The file name is supplied by the user from the list of files available in the work space. If the file contains a series of ad hoc retrieval commands, the data base will execute the commands in the order they appear in the file. However, if the file is a report writer file, the data base will compile the commands and execute the report if a GENERATE statement is included in the file. If this statement is not in the file, the user must enter it after the report is compiled. A GENERATE statement will select the data the user is interested in obtaining. It can contain a WHERE clause to select the data as illustrated in the following example:

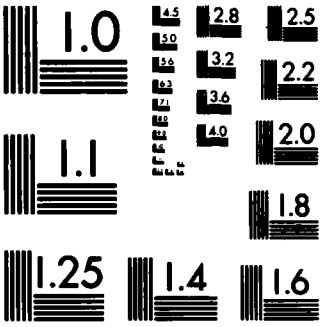
```
GENERATE (report name) WHERE USE FAILS AND C21 EQ
  RANDOM I AND C55 EQ 20;
```

The report name is the name given to the report writer format.

48. Available report writer files. The report writer feature provides the user with the capability to define and generate formatted reports. A number of the report writer files have been developed by CAGE personnel for project use and by personnel at Warm Springs Dam for their use. Copies of all files are stored in user number CERØK2 and can be obtained for use as illustrated above in subparagraph 47a. The file RPTWRT, stored in user number CERØK2, contains a list of basic report writer programs. In addition to the listing, a brief description of each file along with instructions for using the report writer feature is included. A listing of this file is included in Appendix A. Additional

AD-A130 606 GEOTECHNICAL CONSTRUCTION CONTROL DATA BASE SYSTEM 2/2
USER'S MANUAL(U) ARMY ENGINEER WATERWAYS EXPERIMENT
STATION VICKSBURG MS GEOTECHNICAL LAB E V EDRIS ET AL.
UNCLASSIFIED APR 83 WES/IR/GL-83-1 F/G 13/2 NL





report writer program files are described in Appendix B. The following commands are used to obtain a listing of file RPTWRT:

```
C>GET,RPTWRT/UN=CERØK2

C>LIST
```

The available report writer files are described below with some example formats shown.

a. SUMDAY. This report writer file, written by Warm Springs Dam personnel, compiles a daily summary of field testing results. Contained in this report are the location and identification data, comments, a limited summary of classification data, and a complete summary of results from moisture and compaction tests for each field test. Values from the rapid 1-point test are printed on the first line, with final oven-dry values from the 1-point test printed on the second line. Values from 5-point testing, where available, are printed on the third line. This report writer, as shown in Figure 9, is designed to provide a complete summary of compaction and moisture results on a test-by-test basis. There is no internal restriction on the generation of this report writer; this allows the user maximum flexibility in tailoring the output to his needs. The absence of any internal restrictions on generation of the report writer requires a restricting WHERE clause be included in the GENERATE statement. A normal restriction would include Embankment Zone and Report Number in the WHERE statement. Although any KEY element can be included in the WHERE clause, it is generally more efficient (and less expensive) to use components associated with the higher order repeating groups (C20,C40) when possible. Examples of commands used with this report writer follow:

```
COMMAND FILE IS SUMDAY;

GENERATE SUMDAY WHERE C21 EQ RANDOM I AND C55 EQ 56;
```

The following GENERATE commands are additional examples:

```
GENERATE SUMDAY WHERE C21 EQ I.C.MAIN DAM AND C55
  GE 24 AND C55 LE 26 OR C21 EQ RANDOM II AND C55 EQ 6;

GENERATE SUMDAY WHERE C21 EQ RANDOM I AND C65
  EQ 10/06/1980'

GENERATE SUMDAY WHERE C21 EQ RANDOM I AND NO EQ
  11000*11010;
```

b. Histogram report writers. There are six report writer files that generate histogram tables that can be used with a graphic program that will be described later in this

WARM SPRINGS DAM AND LAKE SONOMA OCT/24/1980
EMBANKMENT ZONE AND PERIOD I.C.MAIN DAM REPORT NO. 37
DAILY SUMMARY OF COMPACTION TESTING

TEST NO. / DATE / 5 PT NO.	STATION / OFFSET / ELEV.	WET DEN / CLASS / COLOR	FLD O/O MST	FLD DRY WT.	--ONE POINT-- DRY WT	--ONE POINT-- O/O MST	-----FOC----- DRY WT.	-----FOC----- O/O MST	O/O RCK COR	------AFTER ROCK COR------- DRY WT.	AFTER ROCK COR O/O MST	AFTER ROCK COR O/O CMP	AFTER ROCK COR O/O DEV	TEST NOTES	
24610	16+35	129.6	12.4	115.3	120.3	9.8			4	122.2	11.8	94.4	+0.6	USE=	
1980/08/05	+ 13	SC	14.1	113.6	120.2	9.9	122.1	11.8		122.1	11.8	93.0	+2.3	ABS=	-#4=
	253	BRN												GM=	-#200=
BOR I										NOTES	R(24609)/U-/SEE NOTE 1				
24611	9+90	131.7	9.9	119.8	119.6	6.6			9	125.7	10.6	95.3	-0.7	USE=	
1980/08/05	- 90	SC	13.2	116.3	120.4	5.9	127.0	10.2	3	129.7	9.4	89.7	+3.8	ABS=2.4	-#4=80
IC-177	236	BRN					129.4	10.1		129.4	10.1	89.9	+3.1	GM=2.58	-#200=36
BOR I										NOTES	R(24607)/U-/				
24612	11+10	126.6	13.6	111.4	117.9	6.8			2	125.2	10.8	89.0	+2.8	USE=	
1980/08/05	+ 57	SC	16.5	108.7	117.2	7.4	123.4	11.3		123.4	11.3	88.1	+5.2	ABS=	-#4=
	240	BRN												GM=	-#200=
BOR I										NOTES	U-/				
24613	13+50	135.9	7.4	126.5	121.5	6.6			19	131.7	8.8	96.1	-1.4	USE=	
1980/08/05	+ 100	SC	9.2	124.5	122.2	6.0	128.2	9.8	6	128.2	9.8	97.1	-0.6	ABS=2.1	-#4=74
IC-178	253	BR					128.3	10.2		128.3	10.2	97.0	-1.0	GM=2.64	-#200=31
BOR I										NOTES	NG				
24614	9+65	140.7	10.9	126.9	124.2	7.9			8	127.1	10.1	99.8	+0.8	USE=	
1980/08/06	+ 105	SC	11.2	126.5	123.7	8.3	126.3	10.4	8	129.0	9.6	98.1	+1.6	ABS=1.4	-#4=77
IC-179	241	BR					125.9	10.9		126.9	10.9	99.7	+0.3	GM=2.63	-#200=32
BOR I										NOTES	NG				
24615	8+10	135.2	13.2	119.4	115.5	5.7			1	125.2	10.8	95.4	+2.4	USE=	
1980/08/06	- 64	SC	14.3	118.3	115.3	5.9	124.4	11.1		124.4	11.1	95.1	+3.2	ABS=	-#4=
	238	BR												GM=	-#200=
BOR I										NOTES	NG				

Figure 9. Example of table from report writer file SUMDAY

Part to generate histograms. These files DOWCH, PCH, FDDH, FWCH, GR2H, and PIH produce the histogram tables for the deviation from optimum water content, percent compaction, field dry density, field water content, percent passing the No. 200 sieve, and plastic index, respectively. The tables include the percent for each interval, the number of tests in each interval, the overall average for each embankment zone, and the total number of tests for each embankment zone. Each of these report writers allows the user to specify the embankment zone, report period, tests for which USE fails, or any other data selecting parameter in the GENERATE statement. The report names for these files are OWC for file DOWCH, PC for PCH, MDD for FDDH, WC for FWCH, GR2 for GR2H, and PI for PIH.

The DOWCH report writer produces a histogram table that groups the data into 1 percent intervals within a range of -5 to +5 percent. In addition, the percent of the tests outside the range of -1 to +2 percent is determined. An example of the output from this file is shown in Figure 10, which was generated for all embankment zones using the following commands:

```
COMMAND FILE IS DOWCH;

GENERATE OWC WHERE USE FAILS AND C65 GT 06/01/1980;
```

The PCH file produces the histogram table shown in Figure 11. This table has data intervals of 1 percent with a range of 90 to 105 percent compaction. The tests that fall below 93 percent and 95 percent are grouped together in a column separate from the individual data intervals. Figure 11 was generated with the following commands:

```
COMMAND FILE IS PCH;

GENERATE PC WHERE USE FAILS AND C65 GT 08/01/1980;
```

The FDDH report writer produces a histogram table that groups the data into 5 pcf intervals starting at 110 pcf and continuing to 140 pcf. An example of the output from this file is shown in Figure 12, which was generated for the impervious core of the main dam, Random I and Random II, with the following commands:

```
COMMAND FILE IS FDDH;

GENERATE MDD WHERE USE FAILS AND C65 EQ 01/01/1980 AND
  C21 EQ I.C. MAIN DAM OR C21 EQ RANDOM I OR C21 EQ
  RANDOM II;
```

The FWCH files produce the histogram table shown in Figure 13. This table has data intervals of 2 percent with a range of 2 to 16 percent. The commands used to generate this table for all embankment zones are:

REPORT-HISTOGRAM TABLE FOR DEVIATION FROM OPTIMUM WATER CONTENT
DATE OF REPORT 03/05/81

NOTE-1)BOTH PERCENTAGES AND NUMBER OF TESTS
ARE PRESENTED FOR EACH INTERVAL
2)CONTRACT SPEC. FOR THE DEVIATION
FROM OPTIMUM WATER CONTENT ARE TO

EMBANKMENT ZONE	<-5	[-5,-4)	[-4,-3)	[-3,-2)	[-2,-1)	<-1	[-1,0)	[0,1)	[1,2)	>2	[2,3)	[3,4)	[4,5)	GE5	AVG\TOTAL	
DRAIN	0.0	0.0	0.0	0.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	
	0.	0.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.		1.
FILTER	0.0	0.0	0.0	9.1	27.3	36.4	18.2	27.3	0.0	18.2	4.5	9.1	0.0	4.5	0.0	
	0.	0.	0.	2.	6.	8.	4.	6.	0.	4.	1.	2.	0.	1.		22.
I.C.MAIN DAM	0.0	0.0	0.3	0.6	4.8	5.7	19.0	27.4	27.7	20.2	13.6	5.1	1.2	0.3	0.9	
	0.	0.	1.	2.	16.	19.	63.	91.	92.	67.	45.	17.	4.	1.		332.
O.W.BAK RAD	0.0	0.0	0.0	0.0	66.7	66.7	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	
	0.	0.	0.	0.	2.	2.	1.	0.	0.	0.	0.	0.	0.	0.		3.
O.W.D&FH EMB	0.0	0.0	0.0	0.0	12.5	12.5	50.0	0.0	12.5	25.0	0.0	25.0	0.0	0.0	0.5	
	0.	0.	0.	0.	1.	1.	4.	0.	1.	2.	0.	2.	0.	0.		8.
O.W.S&G BAK	0.0	0.0	0.0	10.0	0.0	10.0	20.0	60.0	10.0	0.0	0.0	0.0	0.0	0.0	0.1	
	0.	0.	0.	1.	0.	1.	2.	6.	1.	0.	0.	0.	0.	0.		10.
RANDOM I	0.0	0.0	0.0	1.4	13.3	14.6	37.3	30.4	12.2	5.6	3.8	1.6	0.1	0.0	0.0	
	0.	0.	0.	10.	98.	108.	275.	224.	90.	41.	28.	12.	1.	0.		738.
RANDOM II	0.0	0.0	0.4	0.4	8.3	9.0	25.6	36.1	22.6	6.8	5.3	1.5	0.0	0.0	0.4	
	0.	0.	1.	1.	22.	24.	68.	96.	60.	18.	14.	4.	0.	0.		266.
ROAD EMB	0.0	0.0	0.0	0.0	0.0	0.0	62.5	37.5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
	0.	0.	0.	0.	0.	0.	5.	3.	0.	0.	0.	0.	0.	0.		8.

Figure 10. Example of table from report writer file DOWCH

REPORT-HISTOGRAM TABLE FOR PERCENT COMPACTION
DATE OF REPORT 03/05/81

NOTE-1)BOTH PERCENTAGES AND NUMBER OF TESTS
ARE PRESENTED FOR EACH INTERVAL
2)SPECIFIED DESIGN DENSITY IS 0095.00

EMBANKMENT ZONE	<90	90TO 91	91TO 92	92TO 93	<93	93TO 94	94TO 95	<95	95TO 96	96TO 97	97TO 98	98TO 99	99TO 100	100- 101	101- 102	102- 103	103- 104	104- 105	GE105	AVG\TOTAL TESTS
FILTER	0.0	0.0	0.0	7.1	7.1	21.4	0.0	28.6	0.0	28.6	7.1	0.0	0.0	21.4	7.1	0.0	0.0	0.0	7.1	97.6
	0.	0.	0.	1.	1.	3.	0.	4.	0.	4.	1.	0.	0.	3.	1.	0.	0.	0.	1.	14.
I.C.MAIN DAM	7.6	2.5	5.1	7.6	22.9	9.3	11.9	44.1	17.8	10.2	7.6	2.5	7.6	5.1	1.7	1.7	0.8	0.0	0.8	95.3
	9.	3.	6.	9.	27.	11.	14.	52.	21.	12.	9.	3.	9.	6.	2.	2.	1.	0.	1.	118.
O.W.BAK RAD	0.0	0.0	0.0	33.3	33.3	0.0	0.0	33.3	33.3	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	94.7
	0.	0.	0.	1.	1.	0.	0.	1.	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	3.
O.W.D&FH EMB	0.0	0.0	0.0	40.0	40.0	20.0	20.0	80.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	94.0
	0.	0.	0.	2.	2.	1.	1.	4.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.	5.
O.W.S&G BAK	0.0	0.0	0.0	20.0	20.0	0.0	0.0	20.0	10.0	20.0	0.0	20.0	20.0	10.0	0.0	0.0	0.0	0.0	0.0	96.8
	0.	0.	0.	2.	2.	0.	0.	2.	1.	2.	0.	2.	2.	1.	0.	0.	0.	0.	0.	10.
RANDOM I	0.5	0.0	0.5	1.2	2.1	4.0	7.0	13.1	12.6	13.1	15.0	11.7	14.1	10.3	4.9	3.5	0.5	0.7	0.5	97.8
	2.	0.	2.	5.	9.	17.	30.	56.	54.	56.	64.	50.	60.	44.	21.	15.	2.	3.	2.	427.
RANDOM II	0.5	0.9	0.9	2.7	5.0	5.0	10.0	20.0	10.0	15.9	18.2	11.8	10.0	8.2	3.2	2.3	0.5	0.0	0.0	97.2
	1.	2.	2.	6.	11.	11.	22.	44.	22.	35.	40.	26.	22.	18.	7.	5.	1.	0.	0.	220.
ROAD EMB	0.0	0.0	0.0	0.0	0.0	12.5	12.5	25.0	0.0	0.0	25.0	12.5	12.5	12.5	0.0	12.5	0.0	0.0	0.0	98.1
	0.	0.	0.	0.	0.	1.	1.	2.	0.	0.	2.	1.	1.	1.	0.	1.	0.	0.	0.	8.

Figure 11. Example of table from report writer file PCH

REPORT-HISTOGRAM TABLE FOR FIELD DRY DENSITY
DATE OF REPORT 03/05/81

NOTE-BOTH PERCENTAGES AND NUMBER OF TESTS
ARE PRESENTED FOR EACH INTERVAL

EMBANKMENT ZONE	<110	[110,115)	[115,120)	[120,125)	[125,130)	[130,135)	[135,140)	GE140	AVG\TOTAL TESTS
DRAIN	0.0	50.0	50.0	0.0	0.0	0.0	0.0	0.0	112.7
	0.	1.	1.	0.	0.	0.	0.	0.	2.
FILTER	0.0	0.0	12.5	29.2	33.3	8.3	12.5	4.2	127.3
	0.	0.	3.	7.	8.	2.	3.	1.	24.
I.C.MAIN DAM	2.4	13.1	41.1	32.1	10.1	1.2	0.0	0.0	119.4
	8.	44.	138.	108.	34.	4.	0.	0.	336.
O.W.BAK RAD	0.0	0.0	0.0	0.0	0.0	33.3	66.7	0.0	135.6
	0.	0.	0.	0.	0.	1.	2.	0.	3.
O.W.D&FH EMB	0.0	0.0	12.5	25.0	25.0	37.5	0.0	0.0	126.4
	0.	0.	1.	2.	2.	3.	0.	0.	8.
O.W.S&G BAK	9.1	9.1	0.0	0.0	0.0	18.2	27.3	36.4	133.7
	1.	1.	0.	0.	0.	2.	3.	4.	11.
RANDOM I	0.0	0.0	1.1	4.6	17.9	48.3	24.7	3.4	132.5
	0.	0.	12.	48.	189.	509.	260.	36.	1054.
RANDOM II	0.3	0.0	2.7	5.0	22.7	47.7	21.0	0.7	131.4
	1.	0.	8.	15.	68.	143.	63.	2.	300.
ROAD EMB	0.0	12.5	12.5	0.0	12.5	37.5	25.0	0.0	128.7
	0.	1.	1.	0.	1.	3.	2.	0.	8.

Figure 12. Example of table from report writer file FDDH

REPORT-HISTOGRAM TABLE FOR FIELD WATER CONTENT
DATE OF REPORT 03/05/81

NOTE-BOTH PERCENTAGES AND NUMBER OF TESTS
ARE PRESENTED FOR EACH INTERVAL

EMBANKMENT ZONE	<2	[2,4)	[4,6)	[6,8)	[8,10)	[10,12)	[12,14)	[14,16)	GE16	AVG\TOTAL TESTS
DRAIN	0.0	50.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9
	0.	1.	1.	0.	0.	0.	0.	0.	0.	2.
FILTER	0.0	0.0	25.0	33.3	25.0	16.7	0.0	0.0	0.0	7.7
	0.	0.	6.	8.	6.	4.	0.	0.	0.	24.
I.C.MAIN DAM	0.0	0.0	0.0	0.6	6.0	37.0	43.1	11.4	1.8	12.2
	0.	0.	0.	2.	20.	123.	143.	38.	6.	332.
O.W.BAK RAD	0.0	66.7	33.3	0.0	0.0	0.0	0.0	0.0	0.0	4.5
	0.	2.	1.	0.	0.	0.	0.	0.	0.	3.
O.W.DSFH EMB	0.0	0.0	12.5	37.5	12.5	25.0	12.5	0.0	0.0	8.3
	0.	0.	1.	3.	1.	2.	1.	0.	0.	8.
O.W.S&G BAK	0.0	9.1	45.5	36.4	0.0	9.1	0.0	0.0	0.0	6.2
	0.	1.	5.	4.	0.	1.	0.	0.	0.	11.
RANDOM I	0.0	0.0	11.8	54.7	22.9	8.4	1.5	0.7	0.0	7.6
	0.	0.	87.	404.	169.	62.	11.	5.	0.	738.
RANDOM II	0.0	0.0	4.5	49.2	35.7	8.6	1.5	0.4	0.0	8.0
	0.	0.	12.	131.	95.	23.	4.	1.	0.	266.
ROAD EMB	0.0	0.0	0.0	50.0	37.5	12.5	0.0	0.0	0.0	8.5
	0.	0.	0.	4.	3.	1.	0.	0.	0.	8.

Figure 13. Example of table from report writer file FWCH

COMMAND FILE IS FWCH;

GENERAL WC WHERE USE FAILS AND C65 GT 01/01/1980;

The GR2H report writer produces a histogram table that groups the data into 5-percent intervals ranging from 0 to 50 percent. The PIH file generates a histogram table with data intervals of 5 percent and a range of 0 to 30 percent. The commands to generate these two tables are the same as the above examples with the field and report names changed accordingly.

c. Summary result reports. These report writer files were written by Warm Springs Dam personnel for use with their data base system:

(1) SUMREPT. This report writer file is designed to summarize final testing results for a selected zone and report period. The file compiles a ranking of percent compaction, percent deviation from optimum moisture, and a summary of testing organized by lab and test type. The ranking of both percent compaction and deviation from optimum moisture are incremented in steps of 1 percent. The average value of percent compaction and deviation are given along with the number of tests included in the summary. A quick reference of the percentage of passing and failing tests is provided for both the compaction and moisture specifications. Figure 14 is an example of the report generated by this file. The output of this report writer is ordered by Embankment Zone (C21) and Report Number (C55). A change in either the embankment zone or report number during the execution of the report writer will cause the output to skip to a new page. This file is internally restricted to tests for which USE (C63) fails, i.e., only tests which are neither voided or retested by a subsequent test are considered. The component USE (C63) allows elimination of voided tests from statistical consideration. This report writer is specifically designed to summarize testing results by report period. Any combination of embankment zone or report period may be listed in the WHERE clause when generating this report writer. The report writer cannot combine data from different zones or different report periods. Proper use of this report writer requires specification of Embankment Zone (C21), Report Number (C55), Begin Date (C41), or End Date (C43) in the WHERE clause. Examples of commands used with this report writer are:

COMMAND FILE IS SUMREPT;

GENERATE SUMREPT WHERE C21 EQ RANDOM I AND C55 EQ 43;

The following commands are additional examples of GENERATE statements that can be used with this report writer:

WARM SPRINGS DAM AND LAKE SONOMA

SUMMARY RANKING OF FIELD COMPACTION TESTING
JAN/19/1981

RANDOM II
REPORT NO. 43
JAN/01/1981 THRU JAN/10/1980

RPT NO.	CNT	AVG CMP	<93	>93 <95	>95	<90	>90 <91	>91 <92	>92 <93	>93 <94	>94 <95	>95 <96	>96 <97	>97 <98	>98 <99	>99 <100	>100 <101	>101 <102	>102 <103	>103 <104	>104
43	18	97.4	0.0	22.2	77.8	0.0	0.0	0.0	0.0	5.6	16.7	5.6	22.2	5.6	22.2	5.6	11.1	0.0	5.6	0.0	0.0

SUMMARY RANKING OF FIELD MOISTURE TESTING
JAN/19/1981

RANDOM II
REPORT NO. 43
JAN/01/1981 THRU JAN/10/1980

RPT NO.	CNT	AVG DEV	<-1	>-1 <2	>2	<-5	>-5 <-4	>-4 <-3	>-3 <-2	>-2 <-1	>-1 <0	>0 <1	>1 <2	>2 <3	>3 <4	>4 <5	>5
43	18	+ 0.9	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7	22.2	61.1	0.0	0.0	0.0	0.0

FOUNDATION AND MATERIALS SOIL TESTING
JAN/19/1981

RANDOM II
REPORT NO. 43
JAN/01/1981 THRU JAN/10/1980

--ALL F&M TESTING-- TESTS	5 PT	1 PT	-------QC LAB------- TESTS	5 PT	1 PT	-------QA LAB------- TESTS	5 PT	1 PT
23	11	12	14	3	11	9	8	1

Figure 14. Example of table from report writer file SUMREPT

```
GENERATE SUMREPT WHERE C21 EQ RANDOM I AND C55 GE 48
  OR C55 LE 52;

GENERATE SUMREPT WHERE C21 EQ RANDOM I AND C55 EQ 37
  OR C21 EQ RANDOM II AND C55 EQ 18;

GENERATE SUMREPT WHERE C41 EQ 06/10/1980;
```

(2) SUMCMP. This report writer file contains just the percent compaction summary of SUMREPT. An example is presented in Figure 15.

(3) SUMCMPX. This file is the same as SUMCMP but is not ordered by report periods.

(4) SUMDEV. This report writer file contains just the deviation from optimum water content portion of SUMREPT. An example is presented in Figure 16.

(5) SUMDEVX. This file is the same as SUMDEV but the report periods are not ordered.

(6) SUMSUM. This report combines SUMCMP and SUMDEV along with providing information about tests that fail to meet the specifications. Tests that have been retested or voided tests (USE exists) are not included. An example of the report is shown in Figure 17.

(7) SUMLABD. This file summarizes the total number of tests that were taken along with how many 1-point and 5-point tests there were. The number of tests each lab performs are also included. The table is generated for each date a test was run and each embankment zone as Figure 18 illustrates.

(8) SUMLABW. This report is similar to SUMLABD except the report is generated on the basis of each report period and embankment zone. Figure 19 shows an example of this report.

d. Classification summary reports. This series of report writers file, written by Warm Springs Dam personnel, is designed to generate tables that summarize the classification data for the 5-point soil testing. These report writers include the data for U. S. Geological Survey Soil Classification, specific gravity values, borrow source, Atterberg limits, the full gradation, test identification, maximum density, and optimum moisture content. This series of report writers demonstrates the flexibility of System 2000. By making simple changes in the statement ORDERED BY in the report writer file the output can be rapidly adjusted to emphasize the components required by the user. The output in each case is similar in appearance; the test data presented and the order in which the data appear are varied. GENERATE statements typically

WARM SPRINGS DAM AND LAKE SONOMA

SUMMARY RANKING OF FIELD COMPACTION TESTING
OCT/24/1980

I.C. MAIN DAM

RPT NO.	CNT	AVG CMP	<93	>93 <95	>95	<90	>90 <91	>91 <92	>92 <93	>93 <94	>94 <95	>95 <96	>96 <97	>97 <98	>98 <99	>99 <100	>100 <101	>101 <102	>102 <103	>103 <104	>104
40	2	95.3	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41	9	93.4	55.6	22.2	22.2	11.1	0.0	22.2	22.2	11.1	11.1	11.1	0.0	0.0	0.0	11.1	0.0	0.0	0.0	0.0	0.0
42	9	94.4	33.3	11.1	55.6	22.2	0.0	0.0	11.1	11.1	0.0	22.2	11.1	11.1	0.0	0.0	0.0	11.1	0.0	0.0	0.0
43	3	93.2	33.3	0.0	66.7	33.3	0.0	0.0	0.0	0.0	0.0	33.3	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
44	24	96.0	16.7	25.0	58.3	8.3	0.0	4.2	4.2	12.5	12.5	12.5	8.3	4.2	8.3	4.2	12.5	4.2	4.2	0.0	0.0

RANDOM I

RPT NO.	CNT	AVG CMP	<93	>93 <95	>95	<90	>90 <91	>91 <92	>92 <93	>93 <94	>94 <95	>95 <96	>96 <97	>97 <98	>98 <99	>99 <100	>100 <101	>101 <102	>102 <103	>103 <104	>104
70	38	98.1	5.3	7.9	86.8	0.0	0.0	0.0	5.3	0.0	7.9	15.8	7.9	13.2	10.5	13.2	13.2	5.3	5.3	0.0	2.6
71	53	98.9	0.0	3.8	96.2	0.0	0.0	0.0	0.0	3.8	0.0	7.5	11.3	15.1	13.2	18.9	13.2	5.7	3.8	0.0	7.5
72	37	98.7	0.0	5.4	94.6	0.0	0.0	0.0	0.0	0.0	5.4	10.8	10.8	2.7	18.9	16.2	18.9	10.8	5.4	0.0	0.0
73	51	97.6	2.0	13.7	84.3	0.0	0.0	2.0	0.0	3.9	9.8	15.7	11.8	15.7	11.8	9.8	9.8	5.9	2.0	2.0	0.0
74	48	97.8	0.0	14.6	85.4	0.0	0.0	0.0	0.0	6.3	8.3	4.2	18.8	20.8	8.3	14.6	10.4	4.2	4.2	0.0	0.0
75	34	97.4	2.9	11.8	85.3	2.9	0.0	0.0	0.0	2.9	8.8	17.6	8.8	2.9	23.5	14.7	11.8	5.9	0.0	0.0	0.0
76	12	98.0	0.0	16.7	83.3	0.0	0.0	0.0	0.0	0.0	16.7	0.0	16.7	16.7	16.7	8.3	8.3	16.7	0.0	0.0	0.0

Figure 15. Example of table from report writer file SUMCMP

WARM SPRINGS DAM AND LAKE SONOMA

SUMMARY RANKING OF FIELD MOISTURE TESTING
OCT/24/1980

T.C.MAIN DAM

RPT NO.	CNT	AVG DEV	<-1	>-1 <2	>2	<-5	>-5 <-4	>-4 <-3	>-3 <-2	>-2 <-1	>-1 <0	>0 <1	>1 <2	>2 <3	>3 <4	>4 <5	>5
40	2	- 0.3	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	50.0	0.0	0.0	0.0	0.0	0.0
41	9	+ 0.7	11.1	77.8	11.1	0.0	0.0	0.0	0.0	11.1	22.2	22.2	33.3	0.0	11.1	0.0	0.0
42	9	+ 0.1	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	55.6	33.3	11.1	0.0	0.0	0.0	0.0
43	3	+ 0.2	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0
44	24	+ 0.5	12.5	83.3	4.2	0.0	0.0	4.2	0.0	8.3	16.7	29.2	37.5	4.2	0.0	0.0	0.0

RANDOM I

RPT NO.	CNT	AVG DEV	<-1	>-1 <2	>2	<-5	>-5 <-4	>-4 <-3	>-3 <-2	>-2 <-1	>-1 <0	>0 <1	>1 <2	>2 <3	>3 <4	>4 <5	>5
70	38	- 0.2	13.2	81.6	5.3	0.0	0.0	0.0	0.0	13.2	52.6	18.4	10.5	2.6	2.6	0.0	0.0
71	53	- 0.0	7.5	92.5	0.0	0.0	0.0	0.0	0.0	7.5	41.5	43.4	7.5	0.0	0.0	0.0	0.0
72	37	- 0.4	13.5	81.1	5.4	0.0	0.0	0.0	2.7	10.8	67.6	10.8	2.7	5.4	0.0	0.0	0.0
73	51	+ 0.0	11.8	88.2	0.0	0.0	0.0	0.0	0.0	11.8	33.3	37.3	17.6	0.0	0.0	0.0	0.0
74	48	+ 0.1	10.4	79.2	10.4	0.0	0.0	0.0	0.0	10.4	41.7	35.4	2.1	10.4	0.0	0.0	0.0
75	34	+ 0.2	5.9	94.1	0.0	0.0	0.0	0.0	0.0	5.9	26.5	50.0	17.6	0.0	0.0	0.0	0.0
76	12	- 0.7	41.7	58.3	0.0	0.0	0.0	0.0	8.3	33.3	33.3	16.7	8.3	0.0	0.0	0.0	0.0

Figure 16. Example of table from report writer file SUMDEV

WARM SPRINGS DAM AND LAKE SONOMA
JAN/27/1981

SUMMARY OF EMBANKMENT TESTING
COMBINED MOISTURE AND COMPACTION
INCLUSIVE THRU JAN/27/1981

EMBANKEMT ZONE	NO. TESTS	FAILS COMPACTION <93.0%	FAILS COMPACTION <95.0%	FAILS MOISTURE >2.0%	FAILS MOISTURE >+3.0%	FAILS MOISTURE <-1.0%	FAILS BOTH COMPACTION AND MOISTURE REQUIREMENTS <93.0% >2.0%	<93.0% >3.0%	<93.0% <-1.0%	<95.0% >2.0%	<95.0% >3.0%	<95.0% <-1.0%
RANDOM I	2007	3.2	13.1	7.0	2.5	13.7	0.8	0.5	0.6	2.2	1.0	1.7

SUMMARY RANKING OF FIELD COMPACTION TESTING

CNT	AVG CMP	<93	<95	<90	>90 <91	>91 <92	>92 <93	>93 <94	>94 <95	>95 <96	>96 <97	>97 <98	>98 <99	>99 <100	>100 <101	>101 <102	>102 <103	>103 <104	>104
2007	97.6	3.2	13.1	0.8	0.5	0.4	1.4	3.7	6.1	13.6	14.2	13.0	13.1	13.3	7.3	5.6	3.3	1.2	2.3

SUMMARY RANKING OF FIELD MOISTURE TESTING

CNT	AVG DEV	<-1	>2	>3	<-5	>-5 <-4	>-4 <-3	>-3 <-2	>-2 <-1	>-1 <0	>0 <1	>1 <2	>2 <3	>3 <4	>4 <5	>5
2007	+ 0.1	13.7	2.5	7.0	0.1	0.1	0.8	2.8	9.8	33.4	29.9	16.0	4.3	1.6	0.6	0.4

Figure 17. Example of table from report writer file SUMSUM

WARM SPRINGS DAM AND LAKE SONOMA

FOUNDATION AND MATERIALS SOIL TESTING
OCT/24/1980

I.C.MAIN DAM

DATE	--ALL F&M TESTING-- TESTS	5 PT	1 PT	-------QC LAB------- TESTS	5 PT	1 PT	-------QA LAB------- TESTS	5 PT	1 PT
1980/07/07	5	1	4	4	0	4	1	1	0
1980/07/08	7	2	5	6	1	5	1	1	0
1980/07/09	7	2	5	5	0	5	2	2	0
1980/07/10	7	1	6	5	1	4	2	0	2
1980/07/11	6	0	6	6	0	6	0	0	0
1980/07/12	7	3	4	5	1	4	2	2	0
TOTALS	39	9	30	31	3	28	8	6	2

RANDOM I

DATE	--ALL F&M TESTING-- TESTS	5 PT	1 PT	-------QC LAB------- TESTS	5 PT	1 PT	-------QA LAB------- TESTS	5 PT	1 PT
1980/07/07	9	1	8	8	0	8	1	1	0
1980/07/08	6	0	6	6	0	6	0	0	0
1980/07/09	8	2	6	8	2	6	0	0	0
1980/07/10	11	3	8	9	2	7	2	1	1
1980/07/11	11	2	9	10	1	9	1	1	0
1980/07/12	4	1	3	3	0	3	1	1	0
1980/07/13	1	1	0	0	0	0	1	1	0
TOTALS	50	10	40	44	5	39	6	5	1

Figure 18. Example of table from report writer file SUMLABD

WARM SPRINGS DAM AND LAKE SONOMA

FOUNDATION AND MATERIALS SOIL TESTING
OCT/24/1980

I.C. MAIN DAM

DATE	--ALL F&M TESTING--			-------QC LAB-------			-------QA LAB-------			REPORT
	TESTS	5 PT	1 PT	TESTS	5 PT	1 PT	TESTS	5 PT	1 PT	NO.
1980/07/16	24	6	18	20	2	18	4	4	0	31
1980/09/10	2	0	2	2	0	2	0	0	0	32
1980/07/06	40	9	31	32	3	29	8	6	2	33
1980/07/13	32	3	29	32	3	29	0	0	0	34
1980/07/20	36	6	30	34	4	30	2	2	0	35
TOTALS	134	18	116	120	12	108	14	12	2	

RANDOM I

DATE	--ALL F&M TESTING--			-------QC LAB-------			-------QA LAB-------			REPORT
	TESTS	5 PT	1 PT	TESTS	5 PT	1 PT	TESTS	5 PT	1 PT	NO.
1980/08/25	45	6	39	40	4	36	5	5	0	61
1980/07/06	49	9	40	44	5	39	5	4	1	62
1980/07/13	30	6	24	27	4	23	3	2	1	63
1980/07/20	39	5	34	38	4	34	1	1	0	64
TOTALS	163	26	177	149	13	122	14	12	2	

Figure 19. Example of table from report writer file SUMLABW

restrict the data by zone and report number for SUM5PT; the other report writers will restrict the execution by zone and report period (SUM200), or report period and borrow source (SUMBOR, SBR200, SUMFOC).

(1) SUM5PT. This report writer summarizes the 5-point testing by report period and test number. It provides access to tests taken during a specific report period or to a single test. Figure 20 shows an example of the output for one report period.

(2) SUM200. This file considers all 5-point tests and places these tests in order from fine to coarse using the sieve data for sieves No. 200, 100, 40, and 16. An example of the output from this file is shown in Figure 21.

(3) SUMBOR. The 5-point data are summarized by borrow area and data in this report writer.

(4) SBR200. This file combines report writer file SUM200 and SUMBOR.

(5) SUMFOC. This report writer is initially ordered by material source then by maximum dry density and optimum water content.

e. SUMSUPP. This report writer, written by Warm Springs Dam personnel, compiles the supplementary mechanical analysis summary which is submitted with Eng Form 4080 for DRAIN Material and FILTER Material. The data included in this report are test number, location, full sieve analysis, and the average specific gravity. This file is not internally restricted. The summary generated will include values for all tests. The report writer is specifically designed to summarize the test results by report period, as shown in Figure 22. Any combination of embankment zone or report period can be listed in the WHERE clause when generating the report. All data are listed on a test-by-test basis. Proper use of this report writer requires specification of Embankment Zone, Report Number, Begin Date, or End Date in the WHERE clause. Examples of commands used with this report writer follow:

```
COMMAND FILE IS SUMSUPP;

GENERATE SUMSUPP WHERE C21 EQ DRAIN AND C55 EQ 45;
```

The following commands are additional examples of GENERATE statements that can be used with this report writer:

```
GENERATE SUMSUPP WHERE C21 EQ FILTER AND C43
  EQ 04/18/1979;

GENERATE SUMSUPP WHERE C21 EQ DRAIN AND C55 EQ 21 OR
  C21 EQ FILTER AND C55 GE 21 AND C55 LE 24;
```

WARM SPRINGS DAM AND LAKE SONOMA
SUMMARY OF FIVE POINT COMPACTION TESTS
OCT/24/1980

I.C.MAIN DAM REPORT NO. 33

FIVE PT NO.	TEST NO.	BORROW SOURCE	SOIL CLASS	LL	PI	ABS	GS	GA	GM	OPT MST	MAX DEN	1.5 IN	.75 IN	.38 IN	NO. 4	NO. 10	NO. 16	NO. 40	NO. 100	NO. 200
IC-154	24483	BOR I	SC	36	20	3.0	2.76	2.75	2.54	10.0	127.1	99	91	84	76	62	55	45	35	32
IC-155	24490	BOR I	SC	36	17	3.0	2.77	2.75	2.46	12.3	122.7	99	95	88	81	66	59	47	36	35
IC-156	24493	BOR I	SC	31	10	3.6	2.73	2.60	2.38	12.0	121.9	100	95	89	80	71	66	55	45	40
IC-157	24496	BOR I	SC	31	12	7.7	2.72	2.75	2.54	9.5	127.3	100	94	85	73	57	49	37	26	21
IC-158	24498	BOR I	SC	38	19	3.6	2.75	2.71	2.74	12.8	124.9	98	91	84	76	58	50	38	27	30
IC-161	24507	BOR I	GC	34	17	2.1	2.79	2.71	2.56	11.0	125.4	100	94	82	63	55	51	42	34	29
IC-162	24517	BOR I	SC	32	13	2.9	2.70	2.69	2.50	10.3	126.9	99	94	83	73	60	54	43	29	22
IC-163	24519	BOR I	GC	33	14	3.1	2.74	2.72	2.51	10.4	127.7	97	95	91	85	73	64	51	38	28
IC-164	24522	BOR I	GC	38	17	6.0	2.78	2.73	2.35	10.7	125.3	100	94	79	61	50	45	37	30	25

Figure 20. Example of table from report writer file SUM5PT

WARM SPRINGS DAM AND LAKE SONOMA
SUMMARY OF FIVE POINT COMPACTION TESTS
OCT/24/1980

I.C.MAIN DAM REPORT NO. 33

FIVE PT NO.	TEST NO.	BORROW SOURCE	SOIL CLASS	LL	PI	ABS	GS	GA	GM	OPT MST	MAX DEN	1.5 IN	.75 IN	.38 IN	NO. 4	NO. 10	NO. 16	NO. 40	NO. 100	NO. 200
IC-157	24496	BOR I	SC	31	12	7.7	2.72	2.75	2.54	9.5	127.3	100	94	85	73	57	49	37	26	21
IC-162	24517	BOR I	SC	32	13	2.9	2.70	2.69	2.50	10.3	126.9	99	94	83	73	60	54	43	29	22
IC-164	24522	BOR I	GC	38	17	6.0	2.78	2.73	2.35	10.7	125.3	100	94	79	61	50	45	37	30	25
IC-163	24519	BOR I	GC	33	14	3.1	2.74	2.72	2.51	10.4	127.7	97	95	91	85	73	64	51	38	28
IC-161	24507	BOR I	GC	34	17	2.1	2.79	2.71	2.56	11.0	125.4	100	94	82	63	55	51	42	34	29
IC-158	24498	BOR I	SC	38	19	3.6	2.75	2.71	2.74	12.8	124.9	98	91	84	76	58	50	38	27	30
IC-154	24483	BOR I	SC	36	20	3.0	2.76	2.75	2.54	10.0	127.1	99	91	84	76	62	55	45	35	32
IC-155	24490	BOR I	SC	36	17	3.0	2.77	2.75	2.46	12.3	122.7	99	95	88	81	66	59	47	36	35
IC-156	24493	BOR I	SC	31	10	3.6	2.73	2.60	2.38	12.0	121.9	100	95	89	80	71	66	55	45	40

Figure 21. Example of table from report writer file SUM200

SUPPLEMENTARY REPORT FOR ENG FOR 4080
10/13/1982

WARM SPRINGS DAM AND LAKE SONOMA
AUBURN CONSTRUCTORS
DACW07-78-C-0035

DRAIN
REPORT NO. 45
SHEET 1 OF 1

TEST NO.	DATE MADE	STATION	OFFSET	ELEV	SPEC GRAV	3.0 IN	1.5 IN	1.0 IN	.75 IN	.50 IN	.38 IN	NO. 4	NO. 10	NO. 16	NO. 40	NO. 100	NO. 200
23600	08/04/1982	19+00	-36	479.0		100	100	100	93	64	43	9					
23601	08/05/1982	19+05	-36	480.0		100	100	100	94	59	38	8					

SUBMITTED BY _____

Figure 22. Example of table from report writer file SUMSUPP

f. WEEKS. This report writer computes the report average and cumulative average for the percent compaction, deviation from optimum water content, maximum dry density, optimum water content, field dry density, and field water content. The report number, beginning date, and end date along with the number of tests included in the average are included in the table as shown in Figure 23. The cumulative average starts with the first report period specified in the GENERATE statement. Thus if only one report period is requested, the report and cumulative averages will be the same.

The report writer is not internally restricted, thus the report generated will include values for all tests unless the WHERE clause is restrictive in selecting the data group. Proper use of this report requires specification of embankment zone, report number, and whether the USE field is blank in the WHERE clause. Examples of commands used with this report writer follow:

```
COMMAND FILE IS WEEKS;

GENERATE WEEK WHERE C21 EQ RANDOM I AND USE FAILS
  AND C55 SPANS 1*10;
```

g. GR200. This report writer generates the report and cumulative average for the percent passing the No. 200 sieve. This file is the same as WEEKS except that the gradations are averaged instead of the other results.

REPORT-WEEKLY AND CUMULATIVE AVERAGES BY EMBANKMENT ZONES
DATE OF REPORT

EMBANKMENT ZONE I.C.MAIN DAM

REPORT NO	BEGIN DATE	END DATE	PER COMP AVG	PER COMP CUM	DEV OWC AVG	DEV OWC CUM	MAX DD AVG	MAX DD CUM	OPT WC AVG	OPT WC CUM	FIELD DD AVG	FIELD DD	FIELD WC AVG	FIELD WC CUM	COUN
1	09/27/1978	09/30/1978	96.37	96.37	1.83	1.83	127.27	127.27	10.20	10.20	122.67	122.67	12.13	12.13	3
2	10/02/1978	10/06/1978	95.85	95.90	.33	.47	128.52	128.40	10.18	10.18	123.19	123.14	10.63	10.77	29
3	10/09/1978	10/13/1978	96.46	96.13	1.13	.75	129.03	128.66	9.90	10.06	123.86	123.44	10.44	10.63	23
4	10/16/1978	10/20/1978	96.39	96.23	.45	.64	131.77	129.78	9.05	9.70	127.04	124.74	9.51	10.23	31
5	10/23/1978	10/27/1978	96.49	96.30	.26	.54	130.36	129.94	9.45	9.63	125.79	125.02	9.71	10.09	31
6	10/30/1978	11/04/1978	97.28	96.52	.59	.55	130.77	130.13	9.14	9.52	127.22	125.53	9.73	10.01	35
7	11/06/1978	11/11/1978	98.64	97.04	.30	.49	129.96	130.09	9.43	9.50	128.18	126.17	9.73	9.94	49
8	11/17/1978	11/17/1978	98.01	97.11	.55	.49	132.42	130.25	8.73	9.44	129.76	126.42	9.28	9.90	15
9	11/29/1978	12/02/1978	97.92	97.13	.83	.51	128.34	130.18	10.25	9.47	125.70	126.40	11.08	9.94	8
10	12/04/1978	12/09/1978	98.26	97.25	.27	.48	133.02	130.47	8.92	9.42	130.74	126.83	9.14	9.86	25
11	12/11/1978	12/15/1978	99.39	97.41	.33	.42	137.82	131.04	6.99	9.23	136.97	127.62	6.70	9.61	21
12	12/20/1978	12/22/1978	95.77	97.40	2.13	.44	125.30	130.98	11.20	9.25	119.97	127.54	13.17	9.65	3
13	12/26/1978	12/29/1978	95.28	97.34	1.29	.46	129.95	130.95	9.64	9.26	123.88	127.43	10.77	9.68	8

Figure 23. Example of table from report writer file WEEKS

Example 6

49. The following data base session, shown in Table 9 as Example 6, illustrates the generation of report writer retrievals. Four of the files described earlier are selected for this session. To limit the amount of output, some of the WHERE clauses used in the GENERATE statements are more restrictive than in general use. The first two reports are generated on the terminal, while the last two reports are written to report files that are then listed. The commands to access the data base have been put into file CMD for this example. This session accesses the Warm Springs Dam data base and costs about forty-seven dollars. The third report alone costs about twenty-two dollars because of the number of tests and the calculations involved in the retrieval.

Table 9

Data Base Retrievals Using Report Writer Programs (Example 6)

```
C>GET,CMD
C>GET,SUMDAY/UN=CECELB
C>GET,SUMDAY/UN=CER0K2
C>GET,SUMSPT/UN=CER0K2
C>GET,FDDM/UN=CER0K2
C>GET,SUMSUPP/UN=CER0K2
C>CALL,CMD
 06.09.51.  S2KGET(CORPS)
 82/04/15. 06.09.52. BEGIN SYSTEM 2000  VERSION 2.60F
 ---
I>USER,EVE;SHARED DBN IS SOILDB;
 -556-   ASSIGNED   SOILDB                  16  4960 82/04/14. 12.55.49.
 ---
I>



I>COMMAND FILE IS SUMDAY;
       NO ERRORS HAVE OCCURRED
 ---
I>GENERATE SUMDAY WHERE C21 EQ RANDOM I AND NO EQ 11340% 11344;
 - SELECTED RG IS 60
1
!
```

(Continued)

(Sheet 1 of 5)

Table 9 (Continued)

WARM SPRINGS DAM AND LAKE SONOMA

*** DAILY SUMMARY OF COMPACTION TESTING ***
APR/15/1982

*** RANDOM I REPORT NO. 50***

TEST NO. / DATE / 5 PT NO.	STATION / OFFSET / ELEV.	WET DEN / CLASS / COLOR	FLD 0/0 MST	FLD DRY WT.	--ONE POINT-- DRY WT	--ONE POINT-- 0/0 MST	-----FOC----- DRY WT.	-----FOC----- 0/0 MST	0/0 RCK COR	------AFTER ROCK COR------ DRY WT.	AFTER ROCK COR 0/0 MST	AFTER ROCK COR 0/0 CMP	AFTER ROCK COR 0/0 DEV	TEST NOTES	
11340	22+80	129.0	7.6	119.9	126.8	6.6			18	135.5	7.8	88.5	-0.2	USE=U	
1980/04/14	+ 910	GC	7.0	120.6	127.2	6.3	131.8	8.5	13	134.8	7.8	89.5	-0.8	ABS=3.0	-84=47
RI-246	313	RBRN					132.0	8.2		134.9	7.1	89.4	-0.1	GM=2.54	-8200=19
BOR II									NOTES	U-11341					
11341	22+80	143.6	7.3	133.8	129.0	6.0			24	138.0	6.8	97.0	+0.5	USE=	
1980/04/14	+ 910	SC	6.8	134.5	129.1	5.9	133.4	7.9	20	137.8	6.9	97.6	-0.1	ABS=3.0	-84=
RI-198	313	RBRN					133.2	7.8		137.6	6.2	97.7	+0.6	GM=2.54	-8200=
BOR II									NOTES	R(11340)					
11342	26+40	140.1			127.6	9.6								USE=	
1980/04/14	+ 340	GC	7.4	130.4	128.8	8.5	130.1	9.5	23	135.4	8.0	96.3	-0.6	ABS=	-84=
	344	RBRN												GM=	-8200=
BOR II									NOTES	LEFT ABUT					
11343	22+88	151.3	8.2	139.9	130.4	7.6			16	130.5	7.5	107.2	+0.7	USE=	
1980/04/15	+ 597	GP-GC	6.0	142.7	131.5	6.7	133.4	7.8		136.6	7.0	104.5	-1.0	ABS=	-84=
	320	RBRN												GM=	-8200=
BOR II									NOTES	8 VIBRATORY ROLLER					
11344	20+65	149.2	8.5	137.5	129.2	6.0			4	133.1	7.6	103.3	+0.9	USE=	
1980/04/15	+ 700	GP-GC	7.5	138.8	128.9	6.3	132.5	8.1	14	134.0	7.3	103.6	+0.2	ABS=3.0	-84=51
RI-247	314	RBRN					131.1	8.4		134.0	7.6	103.6	-0.1	GM=2.52	-8200=11
BOR II									NOTES	8 VIBRATORY ROLLER					

(Continued)

Table 9 (Continued)

```
I>COMMAND FILE IS SUMSPT;
      NO ERRORS HAVE OCCURRED
 ---
I>GENERATE SUMSPT WHERE C21 EQ RANDOM I AND C55 EQ 50;
 - SELECTED RG IS 60
1
1
```

WARM SPRINGS DAM AND LAKE SONOMA
SUMMARY OF FIVE POINT COMPACTION TESTS
APR/15/1982
ORDERED BY TEST NUMBER

FIVE PT NO.	TEST NO.	BORROW SOURCE	SOIL CLASS	LL	PI	ABS	GS	GA	GM	OPT MST	MAX DEN	1.5 IN	.75 IN	.38 IN	NO. 4	NO. 10	NO. 16	NO. 40	NO. 100	NO. 200
RI-246	11340	BOR II	GC	31	12	3.0	2.70	2.70	2.54	7.1	134.9	94	83		47	39	36	30	22	19
RI-198	11341	BOR II	SC			3.0			2.54	6.2	137.6									
RI-247	11344	BOR II	GP-GC	28	8	3.0	2.70	2.71	2.52	7.6	134.0	97	83	65	51	40	36	29	17	11
RI-248	11345	BOR II	GC	28	10	3.0	2.74	2.71	2.56	7.3	135.8	98	87		50	38	33	26	16	12
RI-249	11351	BOR II	GC	32	14	3.0	2.67	2.70	2.54	7.0	135.7	96	83		49	38	34	28	18	14
RI-258	11352	BOR II	GC							5.8	141.9									
RI-250	11353	BOR II	GC	39	18	3.0	2.91	3.00	2.71	9.7	134.6	100	90		60	45	41	34	26	24
RI-251	11354	BOR II	GC			3.0			2.71	8.0	134.6									
RI-252	11358	BOR II	GC	37	17	3.0	2.72	2.69	2.55	6.1	136.5	95	82	62	45	36	32	25	18	15
RI-253	11359	BOR II	GW-GC	27	9	3.0	2.73	2.70	2.53	6.5	139.9		73		37	29	25	20	11	8
RI-254	11363	BOR II	SC	31	13	3.0	2.78	2.70	2.42	10.0	128.5	96	91		75	63	57	47	35	32
RI-255	11364	BOR II	GW-GC	25	8	3.0	2.74	2.72	2.59	7.4	135.8	100	88	69	50	37	32	24	13	10
RI-256	11373	BOR II	GC	29	12	3.0	2.67	2.73	2.47			100	93	80	62	54	49	40	30	25

(Continued)

Table 9 (Continued)

```
I>REPORT FILE IS EE1;
 ---
I>COMMAND FILE IS FDDH;
      NO ERRORS HAVE OCCURRED
 ---
I>GENERATE MDD WH C21 EQ RANDOM I OR C21 EQ I.C.MAIN DAM AND
 - SELECTED RG IS 60
 ---
I>C65 SPANS 01/01/1981# 07/01/1981 AND USE FAILS;
 ---
I>REPORT FILE IS EE2;
 ---
I>COMMAND FILE IS SUMSUPP;
      NO ERRORS HAVE OCCURRED
 ---
I>GENERATE SUMSUPP WHERE C21 EQ RANDOM I AND C55 EQ 50 AND GR4 EXISTS;
 - SELECTED RG IS 60
 ---
I>REPORT FILE IS OUTPUT;
 ---
I>EXIT;
 -506-   CLOSED     SOILDB                  16  4960 82/04/14. 12.55.49.
 82/04/15. 06.18.30. END   SYSTEM 2000  VERSION 2.60F
STOP S2K
C>SAVE,EE1
C>SAVE,EE2
C>OLD,EE1
C>LIST
1


                    REPORT-HISTOGRAM TABLE FOR FIELD DRY DENSITY
                    DATE OF REPORT  04/15/82

                    NOTE-BOTH PERCENTAGES AND NUMBER OF TESTS
                         ARE PRESENTED FOR EACH INTERVAL

     EMBANKMENT ZONE  <110  [110,115)  [115,120)  [120,125)  [125,130)  [130,135)  [135,140) GE140   AVG\TOTAL TESTS
     ---------------  ----  ---------  ---------  ---------  ---------  ---------  --------- -----   --------------

1
     I.C.MAIN DAM      1.1       4.0       15.3       47.7       25.6        6.3        0.0   0.0   123.1
                         2.        7.        27.        84.        45.        11.         0.    0.               176.
     RANDOM I          0.6       1.3        4.7        9.5       18.6       36.4       24.2   4.8   131.2
                        22.       45.       160.       325.       638.      *52.       832.   165.                3439.
1
1
C>
```

(Continued)

Table 9 (Concluded)

```
IDLE.
C>OLD,EE2
C>LIST
1
1
```

SUPPLEMENTARY REPORT FOR ENG FOR 4080
04/15/1982

WARM SPRINGS DAM AND LAKE SONOMA
AUBURN CONSTRUCTORS
DACW07-78-C-0035

RANDOM I
REPORT NO. 50
SHEET 1 OF 1

TEST NO.	DATE MADE	STATION	OFFSET	ELEV	SPEC GRAV	3.0 IN	1.5 IN	1.0 IN	.75 IN	.50 IN	.38 IN	NO. 4	NO. 10	NO. 16	NO. 40	NO. 100	NO. 200
11340	04/14/1980	22+80	+910	313.0	2.70	100	94		83			47	39	36	30	22	19
11344	04/15/1580	23+65	+700	314.0	2.70	100	97		83		65	51	40	36	29	17	11
11345	04/15/1980	24+29	+740	326.0	2.72	100	98		87			50	38	33	26	16	12
11351	04/16/1980	25+10	+810	331.0	2.69	100	96		83			49	38	34	28	18	14
11353	04/16/1980	16+80	+475	202.0	2.94	100	100	100	90			60	45	41	34	26	24
11358	04/16/1980	20+90	+345	312.0	2.70	100	95		82		62	45	36	32	25	18	15
11359	04/17/1980	23+50	+890	319.0	2.72	100			73			37	29	25	20	11	8
11363	04/17/1980	17+00	+450	204.0	2.78	100	96		91			75	63	57	47	35	32
11364	04/17/1980	19+81	+318	315.0	2.73	100	100		88		69	50	37	32	24	13	10
11373	04/19/1980	23+00	+780	325.0			100		93		80	62	54	49	40	30	25

SUBMITTED BY _____

```
1
1
1
C>
```

PLEX Retrievals

Description

50. PLEX retrievals use a FORTRAN program to access and retrieve data from the data base. This method allows the data to be manipulated and presented in ways and formats that are permissible in FORTRAN programs but not available with the ad hoc or report writer retrievals. These programs require the skill of a computer programmer to write and are not transportable from one data base to another; but once written, any user can execute the program. This section will deal with existing programs; the user is referred to the System 2000 PLEX Manual (Intel Systems Corporation 1983) for details on writing these programs. There are three PLEX programs currently available for use with this data base system. The first one, the interactive data entry program, has been described in Part III. The other programs generate the Eng Form 4080 and Eng Form 4081. The Eng Form 4080 program, written by San Francisco District personnel, generates the form for the user-specified embankment zone and report period. An example of this computer-generated form is shown in the following example. To execute this program, the commands are:

```
GET,F4080/UN=CERØK2
CALL,F4080
```

The Eng Form 4081 program, a modified version of Eng Form 4080 program, generates the form for the embankment zone and report period specified by the user. To execute this program the commands are:

```
GET,F4081/UN=CERØK2
CALL,F4081
```

Example 7

51. Example 7, shown in Table 10, illustrates the generation of an Eng Form 4080 using a PLI retrieval. In addition to executing the program, the required information needed by the program is shown. For this example explanatory notes are printed at the end of the report. This program accesses the Warm Springs Dam data base and costs about thirteen dollars.

Table 10

Generating ENG FORM 4080 (Example 7)

```
IDLE.
C>GET,SUM4080
C>CALL,SUM4080

 STATUS:
 READY TO START SYSTEM 2000 (S2K).
 S2K STARTED.
 DATABASE OPENED.

SPECIFY THE 2-CHARACTER CODE FOR THE EMBANKMENT ZONE,
TYPE * FOR A LIST OF VALID CODES AND CORRESPONDING
EMBANKMENT ZONE,OR TYPE 'TERM' TO TERMINATE.

I>*

CODE      EMBANKMENT ZONE

 IC          I.C.MAIN DAM
 CI          I.C. COFFER
 FM          FILTER
 DM          DRAIN
 R1          RANDOM I
 R2          RANDOM II
 R3          RANDOM III
 OB          O.W.BAK RAD
 OD          O.W.DRAIN
 OP          O.W.S&G BAK
 OE          O.W.D&FH EMB
 SB          SPLW BAK-RAD
 SD          SPLW DRAIN
 RE          ROAD EMB
 EX          EXPLO TESTS
 RR          RECORD R-I
 RC          RECORD I.C.
 DD          DRAIN DITCH

SPECIFY THE 2-CHARACTER CODE FOR THE EMBANKMENT ZONE,
TYPE * FOR A LIST OF VALID CODES AND CORRESPONDING
EMBANKMENT ZONE,OR TYPE 'TERM' TO TERMINATE.

I>R2

CODE      EMBANKMENT ZONE

 R2          RANDOM II

DO YOU WANT TO RE-ENTER THE CODE? (YES OR NO)

I>NO

ENTER THE REPORT NUMBER

I>37

REPORT # 37 FOR ZONE - RANDOM II
INCLUDES TESTS FROM  80/11/09. TO  80/11/15.

DO YOU WANT TO RE-ENTER THE REPORT NUMBER?

I>NO

DO YOU WANT THE COLUMN EXPLANATION TABLE INCLUDED IN THE REPORT?

I>YES

DO YOU WANT THE PRINTOUT AT YOUR TERMINAL OR
HELD FOR LATER DISPOSITION? (TERM OR HELD)

I>TERM

ARE YOU AT A TEKTRONIX TERMINAL?(YES OR NO)

I>YES

ALIGN THE PRINTER WITH THE TOP OF THE PAGE TO ENSURE THE PROPER PAGE FORMAT.
HIT CARRIAGE RETURN TO CONTINUE.

I>
```

(Continued)

Table 10 (Continued)

WEEKLY SUMMARY OF FIELD COMPACTION CONTROL TESTS

PROJECT : WARM SPRINGS DAM AND LAKE SONOMA		DATE OF REPORT :	REPORT NO : 37
RIVER : WARM SPRINGS AND DRY CREEK			
TOWN : GEYSERVILLE	CONTRACT NO : DACW07-78-C-0035	11/15/80	
STATE : CA			SHEET 1 OF 3
CONTRACTOR: AUBURN CONSTRUCTORS			

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (B)	LIFT THICKNESS (IN):	NUMBER OF PASSES
RANDOM II	95.00	-1 2	VIBRATORY RH199	LOOSE : 8 COMPACTED : 6	8

TEST NO	DATE MADE	TST TYP	STA	OFF SET (FT)	ELEV (FT)	DEP (IN)	BORROW SRCE	COLOR / CLASS	GRADATION MAX PART SIZE (IN)	% PASSING 3/4 IN	% PASSING #4 SIV	% PASSING #200 SIV	ATTER-BERG LIMITS LL	ATTER-BERG LIMITS PI	DATA TOTAL SAMPLE DRY DEN (PCF)	DATA TOTAL SAMPLE WATR CONT (%)	MOD METHOD T	MOD METHOD 1-PT E DRY DEN (PCF)	MOD METHOD 1-PT S WATR CONT T (%)	1 PT EST OR 5 PT (%) MAX DRY DEN (PCF)	1 PT EST OR 5 PT (%) OPT WATR CONT (%)	FIELD&LAB CORR W %	FIELD&LAB CORR +OR- %	FIELD&LAB CORR COMP %
COL 1	2	3	4	5	6	7	9	10	11	12	13	14	15	16	17	20	21	22	23	24	25	26		
20517	11/11/80	SV	09+90	D	479	256.6	0	SPW	GRAY	1.500	***	***	***	***	**	136.4	6.3	6	131.8	4.2	140.1	6.5	-.2	97.4
COMMENTS-(NONE GIVEN							)	GC																
20518	11/11/80	SV	09+69	D	592	253.0	0	SPW	GRAY	2.000	***	***	***	***	**	132.0	6.3	6	131.8	4.4	141.4	6.2	.1	93.4
COMMENTS-(NONE GIVEN							)	GC																
20519	11/12/80	SV	11+64	D	521	257.0	0	SPW	GRAY	3.000	***	***	***	***	**	123.8	6.4	6	126.0	4.2	*****	****	**********	
COMMENTS-(VOID +3/4 >35%							)	GC																
20520	11/12/80	SV	09+92	D	586	259.0	0	SPW	GRAY	2.000	***	***	***	***	**	124.5	10.0	6	117.7	6.3	130.1	9.3	.7	95.7
COMMENTS-(INSTRUMENT PAD I-19							)	GC																
20521	11/12/80	SV	11+64	D	521	257.0	18	SPW	GRAY	3.000	***	***	***	***	**	126.6	8.3	6	124.3	3.9	139.1	6.8	1.5	91.0
COMMENTS-(TWELVE PASSES							)	GC																
20522	11/13/80	SV	12+75	D	530	264.0	0	SPW	GRAY	1.000	***	***	***	***	**	125.9	10.0	6	119.0	6.7	126.4	10.4	-.4	99.6
COMMENTS-(NONE GIVEN							)	GC																
20523	11/13/80	SV	09+93	D	488	267.0	0	SPW	GRAY	1.000	***	***	***	***	**	117.5	11.7	6	121.2	6.1	128.0	9.0	2.7	91.8
COMMENTS-(U-20525 INSTRUMENT PAD C-43							)	GC																
20524	11/13/80	SV	12+05	D	595	262.0	0	SPW	GRAY	1.500	***	***	***	***	**	132.8	6.4	6	127.1	3.6	138.3	6.9	-.5	96.0
COMMENTS-(NONE GIVEN							)	SC																
20525	11/13/80	SV	09+93	D	488	267.0	0	SPW	GRAY	3.000	***	***	***	***	**	127.4	8.3	6	128.7	3.9	141.7	6.2	2.1	89.9
COMMENTS-(R(20523) U-20526 INSTR C-43							)	GC																
20526	11/14/80	SV	09+93	D	488	267.0	0	SPW	GRAY	3.000	***	***	***	***	**	119.0	11.1	6	123.0	5.8	132.2	8.7	2.4	90.0
COMMENTS-(R(20525) INSTRUMENT PAD C-43							)	SC																
20527	11/14/80	SV	12+00	D	560	270.0	0	SPW	GRAY	1.000	93	59	20	29	12	134.2	8.6	6			*133.8	8.3	.3	100.3
COMMENTS-(NONE GIVEN							)	GC																
20528	11/14/80	SV	08+46	D	473	270.0	0	SPW	GRAY	1.500	***	***	***	***	**	128.7	6.9	6	128.6	4.7	137.1	7.3	-.4	93.9
COMMENTS-(NONE GIVEN							)	SC																

PROGRAM 741L3051
COMPUTER GENERATED ENG FORM 4080

R.K. LEATHERMAN
RESIDENT ENGINEER

(Continued)

Table 10 (Continued)

REPORT NO : 37 — RANDOM II — SHEET 2 OF 3

EXPLANATION TABLE

FOR COMPUTER GENERATED 4080 FORM

COL. NO.	TITLE	EXPLANATION
1	TEST NO.	TEST NUMBER.
2	DATE MADE	DATE TEST MADE.
3	TST TYP	TEST TYPE: CYLINDER(CYL),CHUNK(CK),SAND VOLUME(SV),WATER VOLUME(WV),NUCLEAR METHOD(NM),OTHER -(-). TEST TYPE CONSTANT FOR A GIVEN ZONE.
4	STA	TEST STATION.
5	OFFSET (FT)	RECORD OFFSET BY DISTANCE UP/DOWNSTREAM OF CENTERLINE OF DAM OR LEFT/RIGHT OF AXIS.
6	ELEV (FT)	TEST ELEVATION.
7	DEP (IN)	DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
8	.....	COLUMN 8 DELETED.INFORMATION ORIGINALLY CONTAINED IN COLUMN 8 NOW CONTAINED IN 'COMMENTS' FIELD ON SECOND LINE OF TEST DATA INFORMATION.
9	BORROW SRCE	E.G., BORII (BORROW AREA II).
10	CLASS COLOR	SOIL CLASS.WHEN CLASS ESTIMATED,NOTE BY LETTER (E). SOIL COLOR CONTAINED ON SECOND LINE OF TEST DATA INFORMATION.
11	MAX PART SIZE (IN)	MAXIMUM PARTICLE SIZE.
....	(PC PASSING)3/4 IN	THIS COLUMN DOES NOT EXIST ON ORIGINAL 4080,BUT HAS BEEN ADDED FOR THIS REPORT.PERCENTAGE OF TEST MATERIAL PASSING THE 3/4 SIEVE.
12	(PC PASSING)#4 SIV	PERCENTAGE OF TEST MATERIAL PASSING THE #4 SIEVE.
13	(PC PASSING)#200 SIV	PERCENTAGE OF MATERIAL PASSING THE #200 SIEVE.
14	LL	LIQUID LIMIT.
15	PI	PLASTICITY INDEX.
16	DRY DEN (PCF)	FIELD DRY DENSITY.
17	WATR CONT (PC)	FIELD WATER CONTENT.
18	.....	COLUMN 18 DELETED.

R.K. LEATHERMAN
RESIDENT ENGINEER

PROGRAM 741L3051
COMPUTER GENERATED ENG FORM 4080

(Continued)

Table 10 (Continued)

REPORT NO : 37 RANDOM II SHEET 3 OF 3

19	.....	COLUMN 19 DELETED.
20	TEST	TEST TYPE W.R.T. MOLD SIZE.MODIFIED METHOD:(A)4-IN DIA. MOLD,(B) 6-IN DIA. MOLD OUTLINED IN MANUAL 1110-2-1906.IF MATERIAL WITH MAX. PART. SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT USED IN LAB COMPACTION TEST,NOTE AS 'NS' IN COL. 20 AND REPORT DETAILS OF PROCEDURE.
21	1-PT DRY DEN (PCF)	ONE POINT DRY DENSITY.
22	1-PT WATR CONT(PC)	ONE POINT WATER CONTENT.
23	MAX DRY DEN (PCF)	MAXIMUM DRY DENSITY OBTAINED FROM CURVE GENERATED BY ONE POINT OR FIVE POINTS.IF CURVE GENERATED BY FIVE POINTS,VALUE PRECEDED BY A '*'.
24	OPT WATR CONT (PC)	OPTIMUM WATER CONTENT DETERMINED BY ONE POINT OR FIVE POINT CURVE.
25	W (PC) + OR -	COLUMN 17 MINUS COLUMN 22.
26	PC COMPAC	COLUMN 16/COLUMN 23 .

SYMBOL	REFERENCE	EXPLANATION
(B)	COMPACTION EQUIPMENT	ENTER TYPE OF EQUIPMENT USED,E.G.:SHEEPSFOOT ROLLER (SFR),PNEUMATIC ROLLER (PR),VIBRATORY ROLLER (VR),PNEUMATIC HAND TAMPER (PHT),OR VIBRATORY TAMPER (VT).CONTACT PRESSURE FOR 'VR' : 45500 PSI STATIC , 57800 PSI DYNAMIC.
NG	COMMENTS FIELD	INDICATES 'NONE GIVEN'.

PROGRAM 741L3051
COMPUTER GENERATED ENG FORM 4088

R.K. LEATHERMAN
RESIDENT ENGINEER

(Continued)

Table 10 (Concluded)

```
SPECIFY THE 2-CHARACTER CODE FOR THE EMBANKMENT ZONE,
TYPE * FOR A LIST OF VALID CODES AND CORRESPONDING
EMBANKMENT ZONE,OR TYPE 'TERM' TO TERMINATE.

I>TERM

 STATUS:
 DATABASE CLOSED.
*  END OF PROGRAM 741-L3-051  *



  GET,SUM4080
C>CALL,SUM4080

 STATUS:
 READY TO START SYSTEM 2000 (S2K).
 S2K STARTED.

 MESSAGE:
 UNABLE TO OPEN DATABASE -
 DATABASE CURRENTLY BEING UPDATED BY ANOTHER USER
*  END OF PROGRAM 741-L3-051  *
C>
```

Message output when the program is unable to access the data base

Graphic Plots

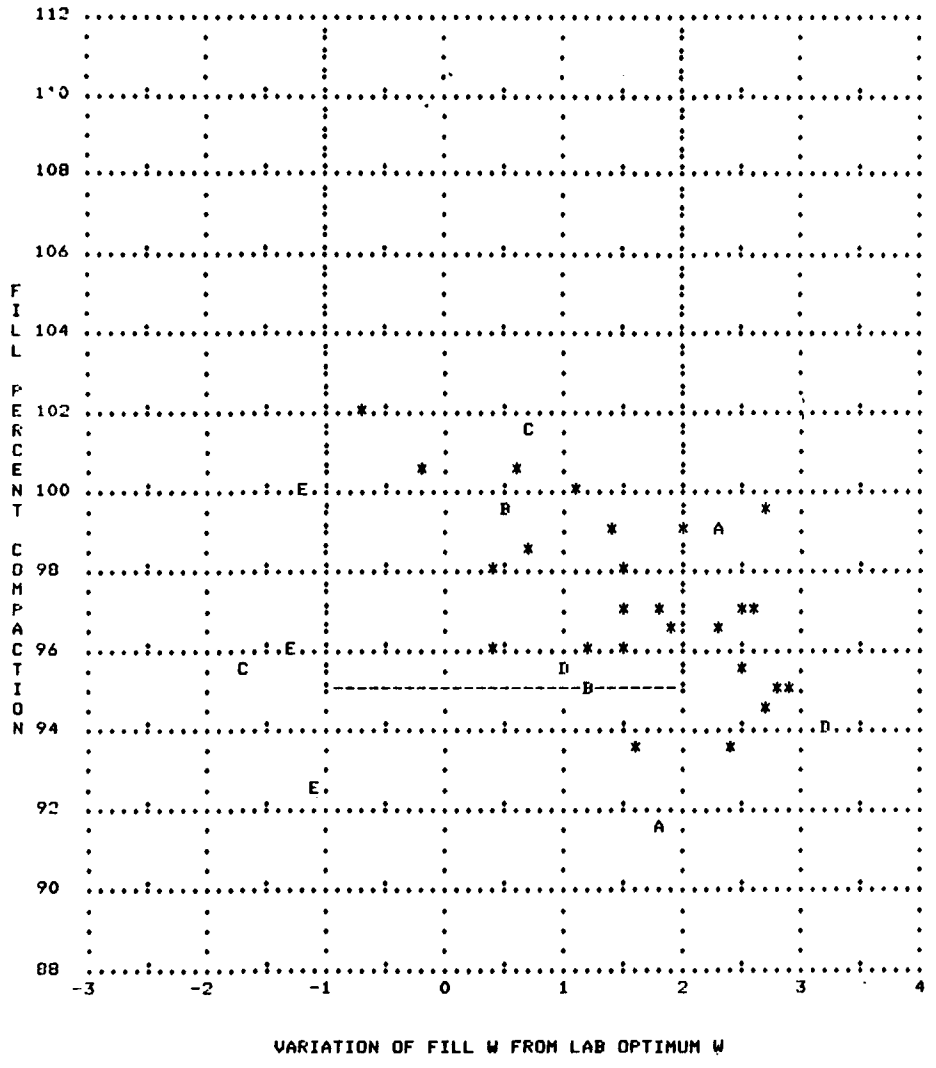
Description

52. General. Graphic programs have been developed for use with the data base to generate plots. All of the programs use a two-step process to generate plots. First, the data file or report file is generated while the user is accessing the data base. The second step consists of using the data file with the graphic program to generate the plot. Three of the four graphic programs were written for a specific type of plot with a specific format for the data file. These plots were designed for a 132-character line printer, but can be used with any equipment that is compatible with the U. S. Army Corps of Engineers Graphics Compatibility System (GCS) except for 80-character alphanumeric terminals. The other program will plot any data in an x-y type of format. This section describes these four graphic programs along with detailing the requirements of the input files. The user is referred to the previous sections for details of the query language and how to generate an OUTPUT or REPORT file. The file GEOPLT stored in user number CERØK2, contains information about the graphic programs currently available. In addition to a brief description of each plot, instructions for obtaining the various data files are included. A listing of this file is included in Appendix C. The following commands are used to obtain a listing of file GEOPLT:

```
C  GET,GEOPLT/UN=CERØK2
C  LIST
```

In addition to this file, other graphic programs are stored in this user number.

53. Shotgun plot. The shotgun plot program will generate the plot shown in Figure 24. In this figure, the specified limits are -1 to +2 for water content and 95 percent for compaction. These values can be varied, with the limits of the water content centered within its range. Failing tests, containing a 'U' in the USE field, are assigned a letter instead of an asterisk. The comment field is then scanned to determine



PROJECT:
WARM SPRINGS DAM AND LAKE SONOMA

DISTRICT:

EMBANKMENT ZONE: I.C. CORER

REPORT PERIOD: 07/30/1979 TO 08/05/1979

REPORT NUMBER: 12

	CUMULATIVE TO THIS REPORT	THIS REPORT
TOTAL NO. OF TESTS		36
NO. OUTSIDE LIMITS:		
TOTAL		18
W		11
DENSITY		3
W & DENSITY		4
NO. REWORKED		
NO. RETESTED AFTER REWORKED		

LEGEND:
* WITHIN ACCEPTABLE LIMITS
A,B,... OUTSIDE ACCEPTABLE LIMITS
1,2,... MULTIPLE TEST PLOT POINT

Figure 24. Example of shotgun plot

the test number of the retest which, when found, assigns the same letter to that test. With the letters or asterisks determined for all the tests in the data file, the plot is generated. A listing of the data file, shown in Figure 25, is printed by the program after the plot is generated. If two or more test values plot at the same point, the asterisk is replaced with a number indicating how many values are at that point. The numbers also appear in the data list so that the user can identify which tests have the same values. Values that occur outside the plotted range are located on the edge of the graph. The information about the number of tests on the right side of Figure 24 is calculated for the current report only. The user must write or type the cumulative results on the plot and draw the lines between corresponding letters to indicate where the failing tests were retested.

54. To generate the shotgun plot, the user must generate a data file from the data base. The following commands must be executed in the prescribed order while the user is working in the data base to generate the data file:

```
REPORT FILE IS PLOT1; (output file name)
LIST C1,C21 WHERE C21 EQ RANDOM I;
LIST C23,C27,C29 WHERE SAME;
LIST C55,C41,C43 WHERE SAME AND C55 EQ 20;
LIST C61,C63,C113,C111,C149 WHERE SAME;
REPORT FILE IS OUTPUT;
```

The component numbers have been defined in Table 1. The data could be grouped by variables other than the report number. Failing tests that are retested in another report can be included in the data file by using the last LIST command and specifying the retest number in the WHERE clause. An example using test number 10542 would be:

```
LIST C61,C63,C113,C111,C149 WHERE NO EQ 10549;
```

The last command returns the output to the user's terminal for any other data base work. The REPORT file is a temporary file and the user is referred to subparagraph 30a for the procedure on using REPORT files.

24555		*	97.2	1.5	R(24549) INSTRUMENT C-44
24556		*	95.9	.4	R(24547)
24557		*	96.2	1.5	NO QUICK RESULTS
24558		*	95.7	2.5	NG
24559		*	100.5	-.2	NG
24560	U	A	91.7	1.8	U-24562
24561		*	95.2	2.9	NG
24562		A	98.8	2.3	R(24560)
24563		*	96.3	2.3	INSTRUMENT I-20
24564	U	B	94.8	1.2	U-24567
24565	U	C	95.6	-1.7	U-24566
24566		C	101.6	.7	R(24565) TOTAL 24 PASSES S.F.
24567		B	99.5	.5	R(24564)
24568		*	98.7	.7	NG
24569		*	96.3	1.9	NG
24570		*	99.2	1.4	NG
24571		*	98.8	2.0	NG
24572		*	97.2	2.6	NG
24573		*	93.3	1.6	NG
24574		*	97.1	2.5	INSTRUMENT C-48
24575		*	100.7	.6	NG
24576		*	98.0	1.5	NG
24577	U	D	93.9	3.2	U-24583
24578		*	95.0	2.8	NG
24579		*	100.1	1.1	NG
24580		*	99.7	2.7	NG
24581		*	101.8	-.7	NG
24582		*	97.0	1.8	NG
24583		D	95.5	1.0	R(24577) INTERFACE
24584		*	93.6	2.4	NG
24585		*	95.9	1.2	RIGHT ABUTTMENT
24586	U	E	95.9	-1.3	U-24587
24587	U	E	92.4	-1.1	R(24586) U-24589
24588		*	94.6	2.7	NG
24589		E	99.8	-1.2	R(24587) REWORKED U
24590		*	97.8	.4	INSTRUMENT C-41

Figure 25. Example listing of data from file for shotgun plot

To generate the plot once the data file exists, the following commands are used:

```
GET,SG/UN=CERØK2
CALL,SG
```

This will begin execution of the program. The system will ask the user the following questions:

```
DEVICE -
NAME OF DATA FILE
```

The user answers the first question with the appropriate response from the following list of devices:

```
PTR FOR 132 'COLUMN TTY's
TEK FOR 4012
T27 FOR 4027
TK4 FOR 4014
T62 FOR TEKTRONIX 4014/TEKTRONIX 4662 (HEX SETTING - 0,3,2,3)
DR4 FOR 4014/CALCOMP PLOTTING
RJE FOR REMOTE CALCOMP PLOTTING(TAPE99)
C93 FOR BOEING CALCOMP PLOTTING(TAPE99)
```

The report file name is entered for the data file. This program was designed for a 132-character line printer, thus the graph produced on other devices may not be presented as well as expected. This program will not work on an alphanumeric device which contains 80 characters per line.

55. Histogram plot. This program will generate histogram plots for the percent compaction, deviation from optimum water content, field dry density, field water content, percent passing No. 200 sieve, and plastic index. The program is very versatile in that it allows the user the following options while working interactively with the program:

KEY - PROGRAM OPTION

1	PRINT LIST OF OPTIONS
2	SELECT NEW DATA FILE
3	SELECT A ZONE
4	ECHO PRINT INPUT
5*	PRINT SIMPLE STATISTICS
6	PLOT A BAR GRAPH
7*	PLOT BAR GRAPH WITH NORMAL CURVE
8	TERMINATE RUN
N*	THESE ITEMS NOT AVAILABLE AT THIS TIME

The user can work with any number of data files and can plot any number of embankment zones from each file. Once the data file is specified, the computer will list the embankment zones and the total number of tests for each zone in the file. The user chooses the embankment zone and then either lists or plots the data (options 4 and 6). The simple statistics and graph with normal curve (options 5 and 7) are not available at this time. An example of a histogram plot that is produced with this program is shown in Figure 26. In this figure, the vertical scale ranges from 0 to 50 percent; however, if one data interval is about 50 percent, the scale will range from 0 to 100 percent. The percent of tests within each data interval is listed at the top of each bar. The total number of tests and the overall average are listed on the bottom right-hand corner of the plot.

56. To use this graphic program, a data file must be generated from the data base. The six histogram report writer files described earlier are used to generate the data files necessary to interface with this graphic program. The user is referred to the section on report files and report writer retrievals presented earlier in this Part for details and instructions on generating the data files. To generate the plot once the data file exists, the following commands are used:

```
GET,HG/UN=CERØK2
CALL,HG
```

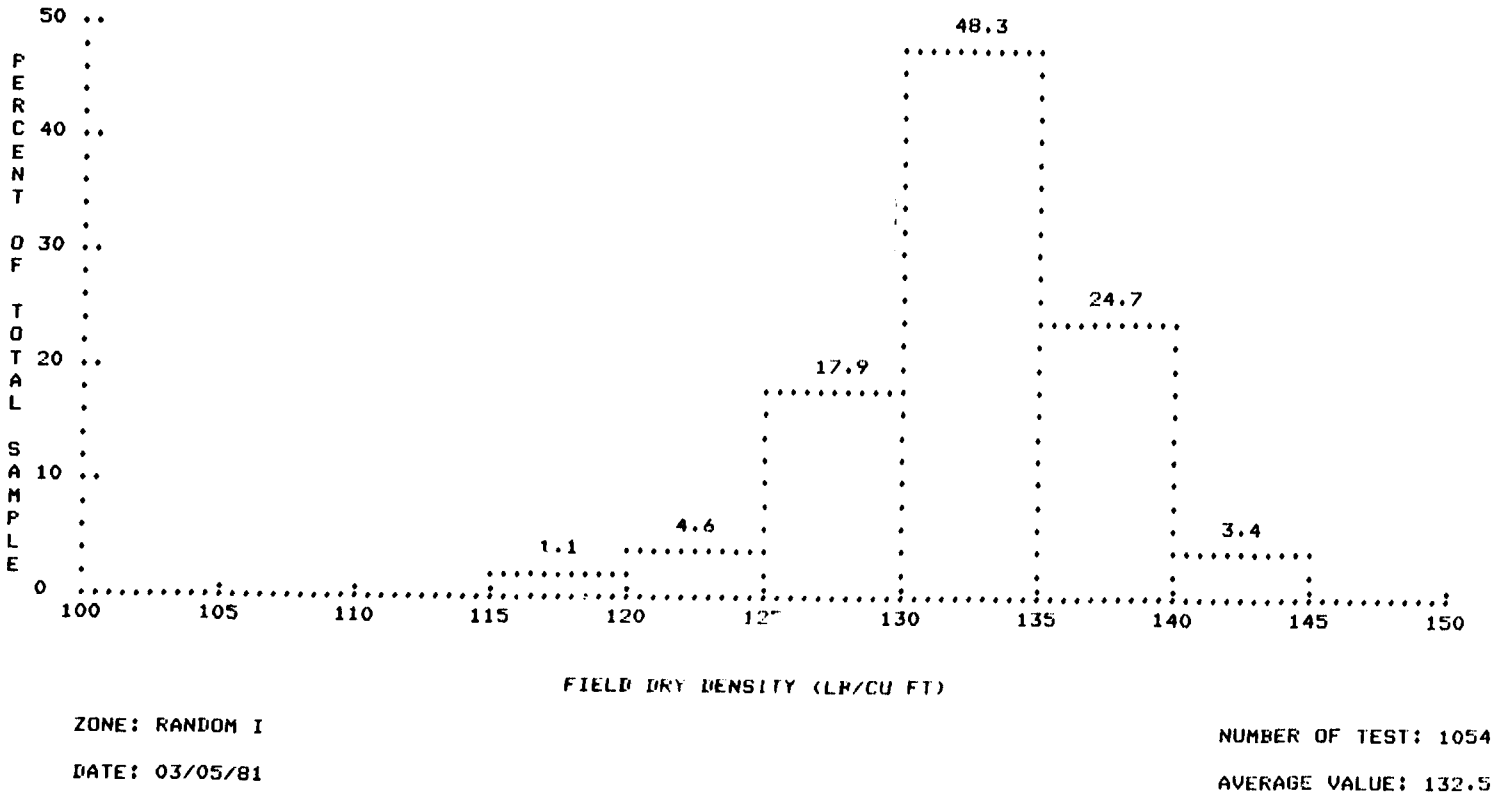


Figure 26. Example of histogram plot

The last command will cause execution of the program. The system will ask the same two questions about the device and data file name that were described for the shotgun plot. The device answer is the same as was described earlier. The data file name is the first file the user plans to use. The program will print the zones and tests for that file. The user will then be asked to select a zone after which the program options will be listed. By selecting options, the user can continue using the program.

57. Generalized x-y plot. This plot program was developed to plot any data in an x-y format as illustrated in Figure 27. Any data file that contains columns of data can be used with this program. The user selects the options from those listed below to generate a plot.

OPTION	DESCRIPTION
1	NAME INPUT DATA FILE
2	READ LABELS FROM FILE
3	INPUT LABELS FROM THE TERMINAL
4	STANDARD SCALE
5	INPUT SCALE FROM THE TERMINAL
6	LINE ADDED TO PLOT
7	PLOT DATA
8	TERMINATE PROGRAM (STOP)

Options 1 and 7 must be selected to generate a plot along with either option 4 or 5. If titles and labels are required, then options 2 or 3 must be selected. The options can be selected one by one or several at a time. In addition to selecting the data file name, the first option determines which data will be plotted. This option will print the data file line by line until the user indicates that the first line of the x-axis data has been encountered. At this point, the user is asked for the column number at the beginning of the data along with the size of the data. The user then indicates how many curves will be plotted along the x-axis. The y-axis data, which could be located in a different data file than the x-axis, is then located by the same method that for the x-axis data. By using this method, data that are located in various

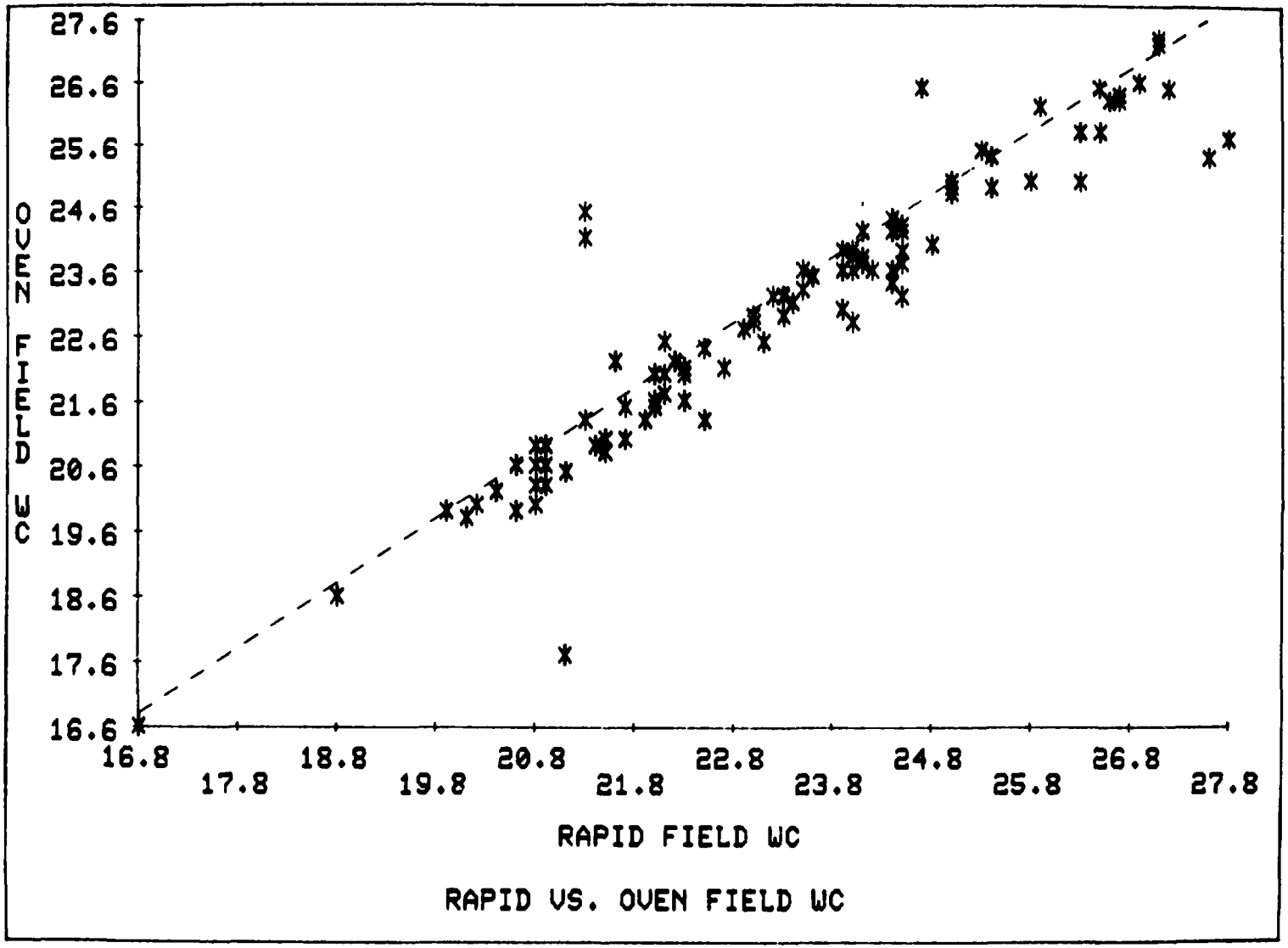


Figure 27. Example of generalized x-y plot

columns can be selected (i.e., plot data in column 6 versus column 2). The last question this option asks the user is whether the data points should be connected with a line. Both the second and third options will read three lines of data up to 23 characters each for the title and x and y axis labels. The second option will read from a user-specified data file, while the third option will prompt the user for the information. The standard scale, option 4, will use the minimum data value to establish the lower end of the scale and then increment the scale by an interval which is determined from the range of the data. If the user does not like the standard scale, option 5 can be used to set the scale. This option can be used to window in on a portion of the data. Option 6 allows up to four lines to be added to the plot (i.e., 45 deg line, or vertical and horizontal specification boundaries). The last two options are self-explanatory. Once the data have been defined, the user can go through the options in any order. Thus, an initial plot with the standard scale could be generated; then the user could modify the scale, add lines, and replot.

58. The data files for use with this plot program can contain any number of data columns and heading information. These files will usually be generated in the data base by using the REPORT File and LIST commands. The only data restriction for this plot program is that only numeric values can be plotted.

59. There are two versions of the generalized plot program that are available. The version that should be used will depend on the type of device on which the plots will be generated. Two programs are required because one of the programs that interacts with the user and the Corps GCS System cannot communicate with a 132-character line printer without special key options in the GCS being set up within the program. Thus, there is a version that must be used with a 132-character line printer and another version for any other device. To generate a plot on a 132-character printer, the following commands are used:

```
GET,GENPLT/UN=CERØK2
CALL,GENPLT
```

For any other device, the following commands are used:

```
GET,GENPLOT/UN=CERØK2
CALL,GENPLOT
```

These commands will begin execution of the program. The system will ask the user for the type of device. The acceptable responses have been described for the shotgun plot. After the device response, the program begins by asking the user to select the various options.

60. Quick versus oven-dried results. This graphic program will generate the plots shown in Figures 28 and 29. The first plot is the quick versus oven-dried field water contents, while the second plot is the quick versus oven-dried 1-point water contents. The user has to add the 45-deg reference line. This program was written by P. Park at WES for a line printer before the generalized x-y plot program. The axes are designed to plot data with water contents below 14 percent. The same plots can be generated with the x-y plot program. However, the user does not have to answer the questions in the quick versus oven-dried program, but the data may not fit the scales built into this plot.

61. In order to generate these plots, the user must first generate a data file from the data base. The following commands must be used in the prescribed order to generate the file:

```
REPORT FILE IS PLOT2; (output file name)
LIST C21,C55,C41,C43 WHERE C21 EQ RANDOM I AND C55 EQ20;
LIST NO,QFWC,FWC,Q1WC,WC1 WHERE SAME AND USE FAILS;
REPORT FILE IS OUTPUT;
```

The component numbers and element names have been defined in Table 1. The data could be grouped by any valid WHERE clause as described in the Ad Hoc Retrieval section. As mentioned previously, the REPORT file must be SAVED after the user has completed the data base session to be a permanent file. To generate the graphs, the following commands are used:

```
GET,QFW/UN=CERØK2
CALL,QFW
```

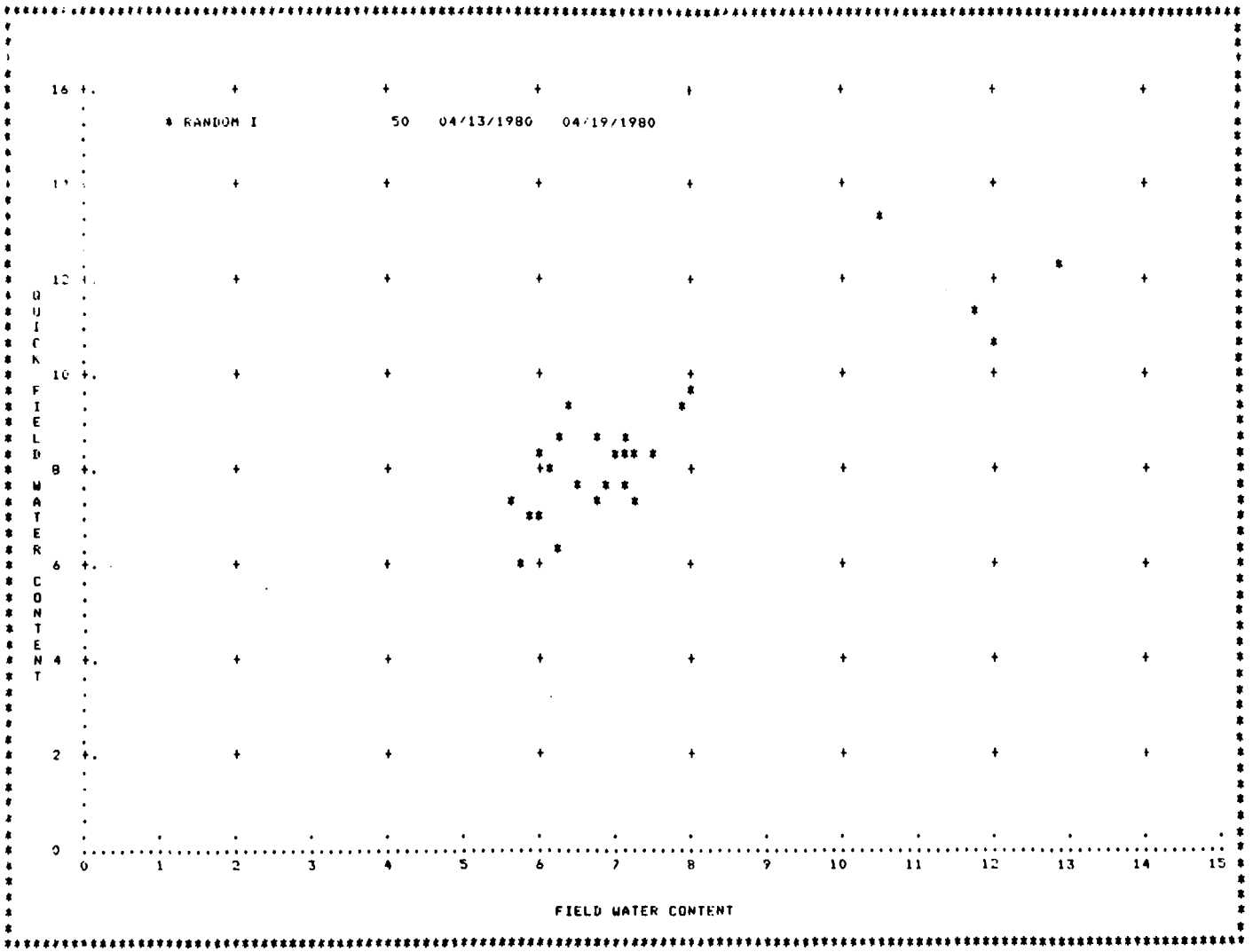


Figure 28. Example of quick versus oven-dried plot for field water content

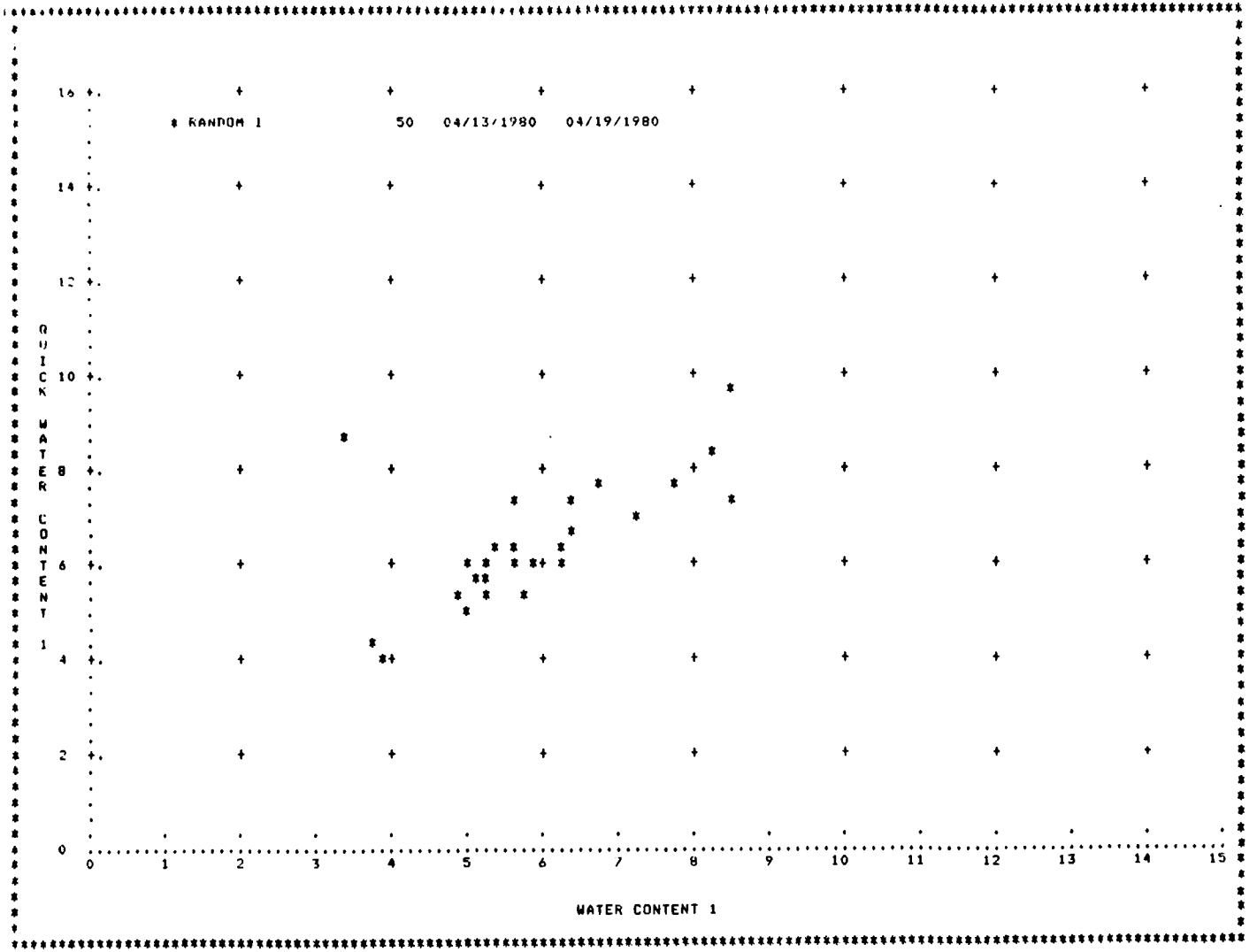


Figure 29. Example of quick versus oven-dried plot for one-point water content

The last command will begin execution of the program. The system will ask the same two questions about the device and data file name as were asked for the shotgun plot. The answers described for that program are valid for this program.

Example 8

62. Each of the graphic programs are illustrated in Table 11 as Example 8. This example begins with a data base session to generate the four report files that will be plotted. The Richard B. Russell Dam data base is accessed to generate the first three report files. The Warm Springs Dam data base is used for the last report file because the other data base does not contain the 1-point water content results. The costs for the data base session is about ten dollars, while the costs for the graphic programs are about four to five dollars each.

Table 11

Procedures for Graphics Program (Example 8)

```
  GET,RBRDB
C>GET,DOWCH/UN=CEROK2
C>GET,PCH/UN=CEROK2
C>CALL,RBRDB
 08.57.06.  S2KGET(CORPS)
 82/04/15. 08.57.06. BEGIN SYSTEM 2000  VERSION 2.60F
 ---
I>USER,DLW;SHARED DBN IS SAVDB;
 -556-   ASSIGNED   SAVDB                    1    85 82/04/05. 11.15.01.
 ---
I>REPORT FILE IS PLOT2;
 ---
I>LIST C1,C21 WHERE C21 EQ IMP;
 ---
I>LIST C23,C27,C29 WHERE SAME;
 ---
I>LIST C55,C41,C43 WHERE SAME AND C55 EQ 4;
 ---
I>LIST C61,C63,C113,C111,C149 WHERE SAME;
 ---
I>REPORT FILE IS PLOT3;
 ---
I>COMMAND FILE IS DOWCH;
       NO ERRORS HAVE OCCURRED
 ---
I>GENERATE OWC WHERE C21 EQ IMP AND C55 EQ 4;
 - SELECTED RG IS 60
 ---
I>REPORT FILE IS PLOT4;
 ---
```

Generating data file for shotgun plot

Generating data files for histogram plots

(Continued)

(Sheet 1 of 26)

Table 11 (Continued)

```
I>COMMAND FILE IS PCH;
       NO ERRORS HAVE OCCURRED
 ---
I>GENERATE PC WHERE C21 EQ IMP AND C55 EQ 4;
 - SELECTED RG IS 60
 ---
I>REPORT FILE IS PLOT5;
 ---
I>LIST C21,C55,C41,C43 WHERE C21 EQ IMP AND C55 EQ 4;
 ---
I>LIST NO,QFWC,Q1WC,FWC,WC1 WHERE SAME AND USE FAILS;
 ................C
 -808- UNRECOGNIZED COMPONENT IDENTIFIER -
 ---
I>LIST NO,QFWC,QDOWC,FWC,DOWC WHERE SAME AND USE FAILS;
 ---
I>EXIT;
 -506-   CLOSED     SAVDB                    1    85 82/04/05. 11.15.01.
 82/04/15. 09.03.00. END   SYSTEM 2000  VERSION 2.60F
STOP S2K
C>SAVE,PLOT2
C>SAVE,PLOT3
C>SAVE,PLOT4
C>SAVE,PLOT5
C>
```

Generating data file for general X-Y plot

(Continued)

Table 11 (Continued)

```
GET,CMD
C>CALL,CMD
 06.22.18.  S2KGET(CORPS)
 82/04/15. 06.22.19. BEGIN SYSTEM 2000  VERSION 2.60F
 ---
I>USER,EVEL,SHARED DBN IS SOILDB;
 -556-   ASSIGNED   SOILDB                    16  4960 82/04/14. 12.55.49.
 ---
I>REPORT FILE IS EEE1;
 ---
I>LIST C21,C55,C41,C43 WHERE C21 EQ RANDOM I AND C55 EQ 50;
 ---
I>LIST NO,QFUC,FUC,Q1UC,UC1 WHERE SAME AND USE FAILS;
 ---
I>REPORT FILE IS OUTPUT;
 ---
I>EXIT;
 -506-   CLOSED     SOILDB                    16  4960 82/04/14. 12.55.49.
 82/04/15. 06.24.35. END   SYSTEM 2000  VERSION 2.60F
STOP S2K
C>SAVE,EEE1
```

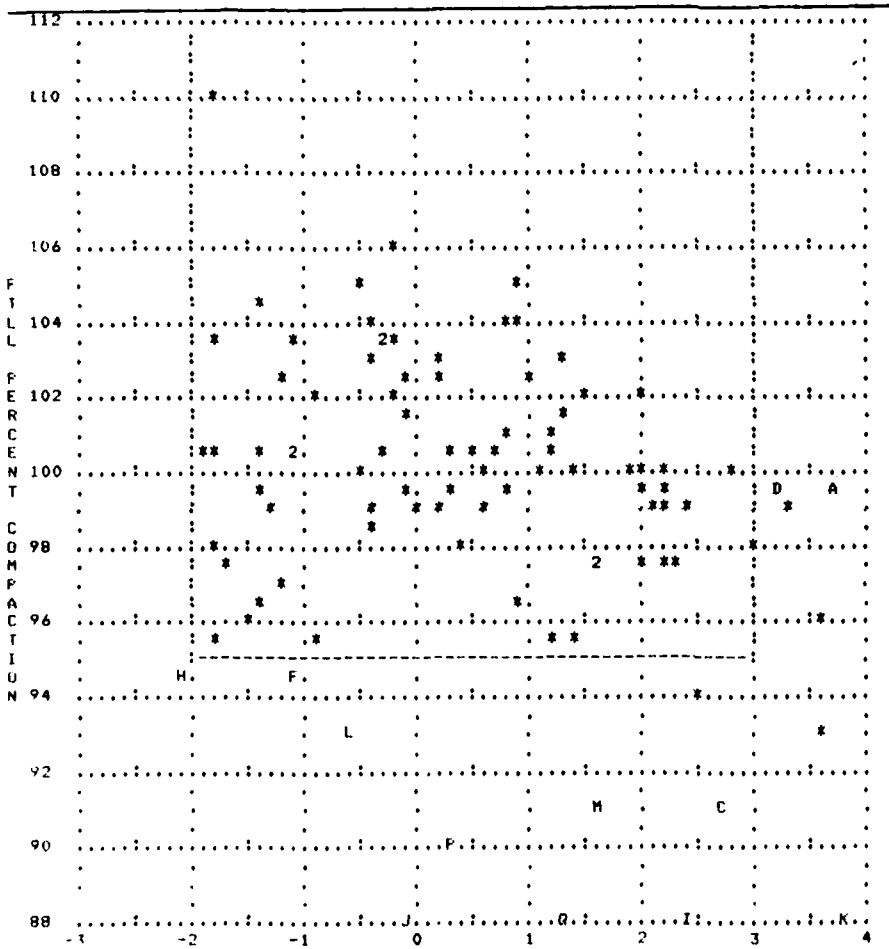
Generating data file for quick vs oven plot

```
  GET,SG/UN=CERON2
C>CALL,SG
 DEVICE-
I-PTR
 "ENTER NAME OF DATA FILE"
I-PLOT2
```

Shotgun plot

(Continued)

Table 11 (Continued)



PROJECT:
RICHARD B. RUSSELL DAM & LAKE

DISTRICT:

EMBANKMENT ZONE: IMP

REPORT PERIOD: 04/01/1981 TO

REPORT NUMBER: 4

	CUMULATIVE TO THIS REPORT	THIS REPORT
TOTAL NO. OF TESTS		99
NO. OUTSIDE LIMITS:		
TOTAL		21
W		5
DENSITY		11
W & DENSITY		5
NO. REWORKED		
NO. RETESTED AFTER REWORKED		

LEGEND:
* WITHIN ACCEPTABLE LIMITS
A,B,... OUTSIDE ACCEPTABLE LIMITS
1,2,... MULTIPLE TEST PLOT POINT

(Continued)

Table 11 (Continued)

1037		*	110.0	-1.8	RETEST FOR #1036	1088		2 *	103.3	-.3		
1038		*	97.7	2.2		1089		*	98.2	.4		
1039		*	99.0	2.2		1090		*	102.4	1.0		
1040		*	102.3	-.1		1091		*	106.1	-.2		
1041		*	102.5	.2		1092		*	102.1	1.5		
1042	U	A	99.7	3.7	REWORKED;NOT RETESTED	1093		*	100.1	2.0		
1043		2 *	97.5	1.6		1094		*	99.7	.3		
1044		*	99.4	2.0		1095		*	104.1	.9		
1045		*	100.8	1.2		1096	U	I	84.9	2.4	REWORKED,RETEST W/1098	
1046		*	99.2	2.1		1097		*	99.5	-.1	GROUND CABLE TRENCH REFILL	
1047	U	B	96.4	4.8	REWORKED,RETEST W/1050	1098		*	100.5	.5	RETEST FOR 1096,CABLE TRENCH	
1048	U	C	91.1	2.7	REWORKED,RETEST W/1051	1099	U	J	0.0	-.1	RAIN PM;MAT'L REMOVED	
1049		*	99.8	2.2		1100	U	K	0.0	3.8	MAT'L REMOVED	
1050		*	96.0	3.6	RETEST FOR 1047,NOT CAUGHT	1101		*	100.0	1.9		
1051		*	97.9	3.0	RETEST FOR #1048	1102		*	105.2	.9		
1052		*	100.1	2.8		1103		*	102.1	-.2		
1053		*	95.4	1.2		1104		*	100.6	1.2		
1054	U	D	99.7	3.2	RETESTED ON 1058	1105		*	96.3	.9		
1055		*	102.9	1.3		1106		*	96.0	-1.5		
1056		*	101.8	2.0		1107		*	99.0	0.0		
1057	U	E	93.3	5.7	MAT'L REMOVED	1108		*	98.4	-.4		
1058		*	99.2	3.3	RETEST FOR 1054;ACCP'D BY EDB	1109		*	97.6	2.3		
1059		*	101.3	1.3		1110		*	103.1	.2		
1060		*	94.0	2.5	MATH ERROR;NO RETEST	1111		2 *	103.3	-.3		
1061		2 *	100.6	-1.1		1112		*	103.1	-.4		
1062		*	103.6	-.2		1113		*	101.8	-.9		
1063		*	95.5	-.9		1114		*	101.6	-.1		
1064		*	99.5	-1.4		1115		*	97.6	-1.7		
1065		*	99.0	.6		1116		*	103.7	-1.8		
1066		*	100.4	-.3		1117		*	100.4	.7		
1067		*	100.3	-1.8		1118		*	99.0	-.4		
1068	U	F	94.5	-1.1	REWORKED,RETEST W/1070	1119		*	100.0	.6		
1069	U	. G	0.0	0.0	TEST VOID;POWER SHORTAGE	1120		*	99.2	.2		
1070	U	H	94.5	-2.1	RETEST FOR 1068,SEE 1071	1121		*	99.0	2.4		
1071		*	98.1	-1.8	RETEST FOR 1068,1070	1122		*	99.1	-1.3		
1072		*	102.4	-1.2		1123		*	103.3	-1.1		
1073		*	100.6	-1.4		1124	U	L	93.0	-.6	REWORKED,RETEST W/1125	
1074		*	105.0	-.5		1125		2 *	97.5	1.6	RETEST FOR 1124	
1075		*	100.1	1.1		1126		*	99.6	2.2		
1076		*	100.5	-1.9		1127		*	100.5	.3		
1077		2 *	100.6	-1.1		1128	U	M	90.9	1.6	REWORKED,RETEST W/1134	
1078		*	101.2	.8		1129		*	95.7	1.4		
1079		*	96.5	-1.4		1130	U	. N	74.0	0.0	AGAINST SAND FILTER,SEE 1131	
1080		*	93.2	3.6	RAPID 99.2,-1.5,NOT CAUGHT	1131	U	O	94.9	5.7	REWORKED,RETEST W/1132	
1081		*	103.8	.8		1132	U	P	89.8	.3	RETEST FOR 1130,1131,SEE 1138	
1082		*	103.8	-.4		1133		*	99.8	1.4		
1083		*	97.0	-1.2		1134	U	Q	87.4	1.3	RETEST FOR 1128,MAT'L REMOVED	
1084		*	100.2	-.5		1138		*	99.5	.8	RETEST FOR 1132	
1085		*	97.5	2.0								
1086		*	95.5	-1.8								
1087		*	104.5	-1.4								

Data list (generated by shotgun program)

(Continued)

Table 11 (Continued)

```
*
C>GET,HG/UN=CEROK2
C>CALL,HG
 DEVICE-
I>PTR
 ENTER NAME OF DATA FILE
I>PLOT3
```

Histogram file (Plot 3)

KEY	ZONE	NUMBER OF TESTS
1	IMP	96.

```
 SELECT ZONE BY KEY
I>1

 KEY - PROGRAM OPTION
  1    PRINT LIST OF OPTIONS
  2    SELECT NEW DATA FILE
  3    SELECT A ZONE
  4    ECHO PRINT INPUT
  5*   PRINT SIMPLE STATISTICS
  6    PLOT A BAR GRAPH
  7*   PLOT BAR GRAPH WITH NORMAL CURVE
  8    TERMINATE RUN
  N*      THESE ITEMS NOT AVAILABLE AT THIS TIME

 SELECT OPTION BY KEY
I>4
1


                    REPORT-HISTOGRAM TABLE FOR DEVIATION FROM OPTIMUM WATER CONTENT
                    DATE OF REPORT  04/15/82

                    NOTE-1)BOTH PERCENTAGES AND NUMBER OF TESTS
                           ARE PRESENTED FOR EACH INTERVAL
                          2)CONTRACT SPEC. FOR THE DEVIATION
                            FROM OPTIMUM WATER CONTENT ARE -02TO 03
```

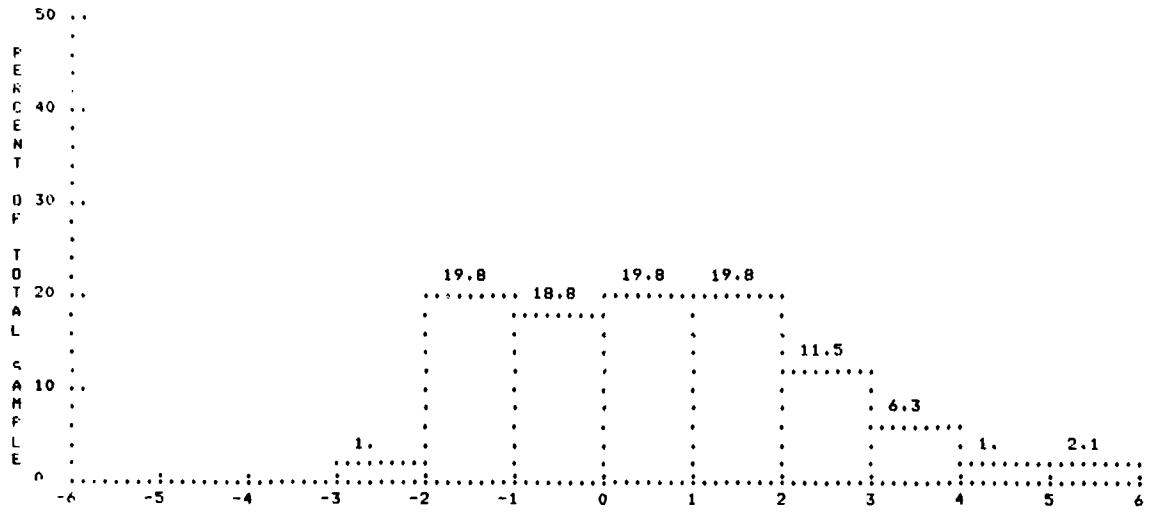
EMBANKMENT ZONE	<-5	[-5,-4)	[-4,-3)	[-3,-2)	[-2,-1)	<-1	[-1,0)	[0,1)	[1,2)	>2	[2,3)	[3,4)	[4,5)	GE5	AVG\TOTAL
IMP	0.0	0.0	0.0	1.0	19.8	20.8	18.8	19.8	19.8	20.8	11.5	6.3	1.0	2.1	0.7
	0.	0.	0.	1.	19.	20.	18.	19.	19.	20.	11.	6.	1.	2.	96.

```
1
1
1

 SELECT OPTION BY KEY
I>6
```

(Continued)

Table 11 (Continued)

Histogram plot (Plot 3)



ZONE: IMP

DATE: 04/15/82

NUMBER OF TEST: 96

AVERAGE VALUE: .7

CONTRACT SPEC. FOR THE DEVIATION
FROM OPTION WATER CONTENT ARE -2 TO 3

(Continued)

Table 11 (Continued)

```
 SELECT OPTION BY KEY
I>2
 ENTER NAME OF DATA FILE
I>PLOT4
```

Histogram file (Plot 4)

KEY	ZONE	NUMBER OF TESTS
1	IMP	96.

```
 SELECT ZONE BY KEY
I>1

 SELECT OPTION BY KEY
I>4
1
```

REPORT-HISTOGRAM TABLE FOR PERCENT COMPACTION
DATE OF REPORT 04/15/82

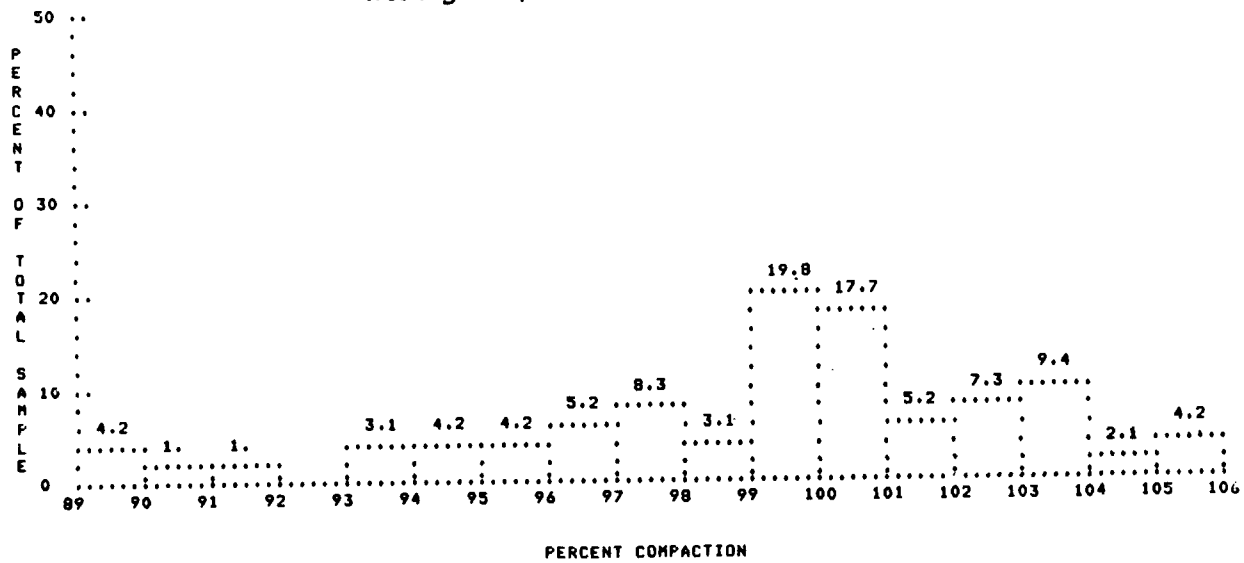
NOTE-1)BOTH PERCENTAGES AND NUMBER OF TESTS
ARE PRESENTED FOR EACH INTERVAL
2)SPECIFIED DESIGN DENSITY IS 0095.00

EMBANKMENT ZONE	<90	90TO 91	91TO 92	92TO 93	<93	93TO 94	94TO 95	<95	95TO 96	96TO 97	97TO 98	98TO 99	99TO 100	100- 101	101- 102	102- 103	103- 104	104- 105	GE105	AVG\TOTAL TESTS
IMP	4.2	1.0	1.0	0.0	6.3	3.1	4.2	13.5	4.2	5.2	8.3	3.1	19.8	17.7	5.2	7.3	9.4	2.1	4.2	98.9
	4.	1.	1.	0.	6.	3.	4.	13.	4.	5.	8.	3.	19.	17.	5.	7.	9.	2.	4.	96.

```
1
1
1

 SELECT OPTION BY KEY
I>6
```

(Continued)

Histogram plot (Plot 4)



ZONE: IMP

DATE: 04/15/82

NUMBER OF TEST:96

AVERAGE VALUE:98.9

SPECIFIED DRY DENSITY IS 95.

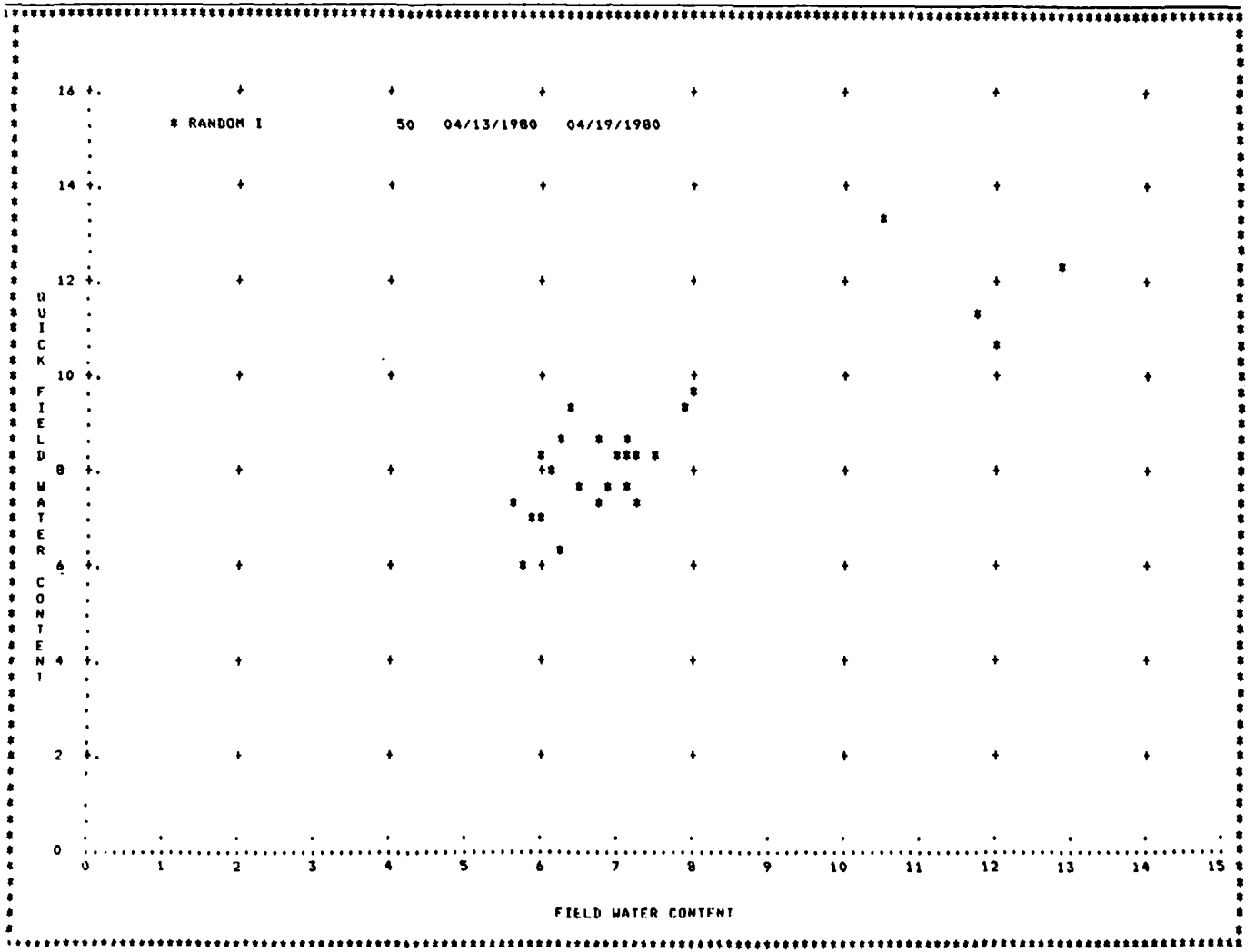
SELECT OPTION BY KEY
I>8

GET,QFW/UN=CEROK2
C>CALL,QFW
DEVICE-
I>PTR
ENTER NAME OF DATA FILE
I>EEE1

Quick vs oven plot

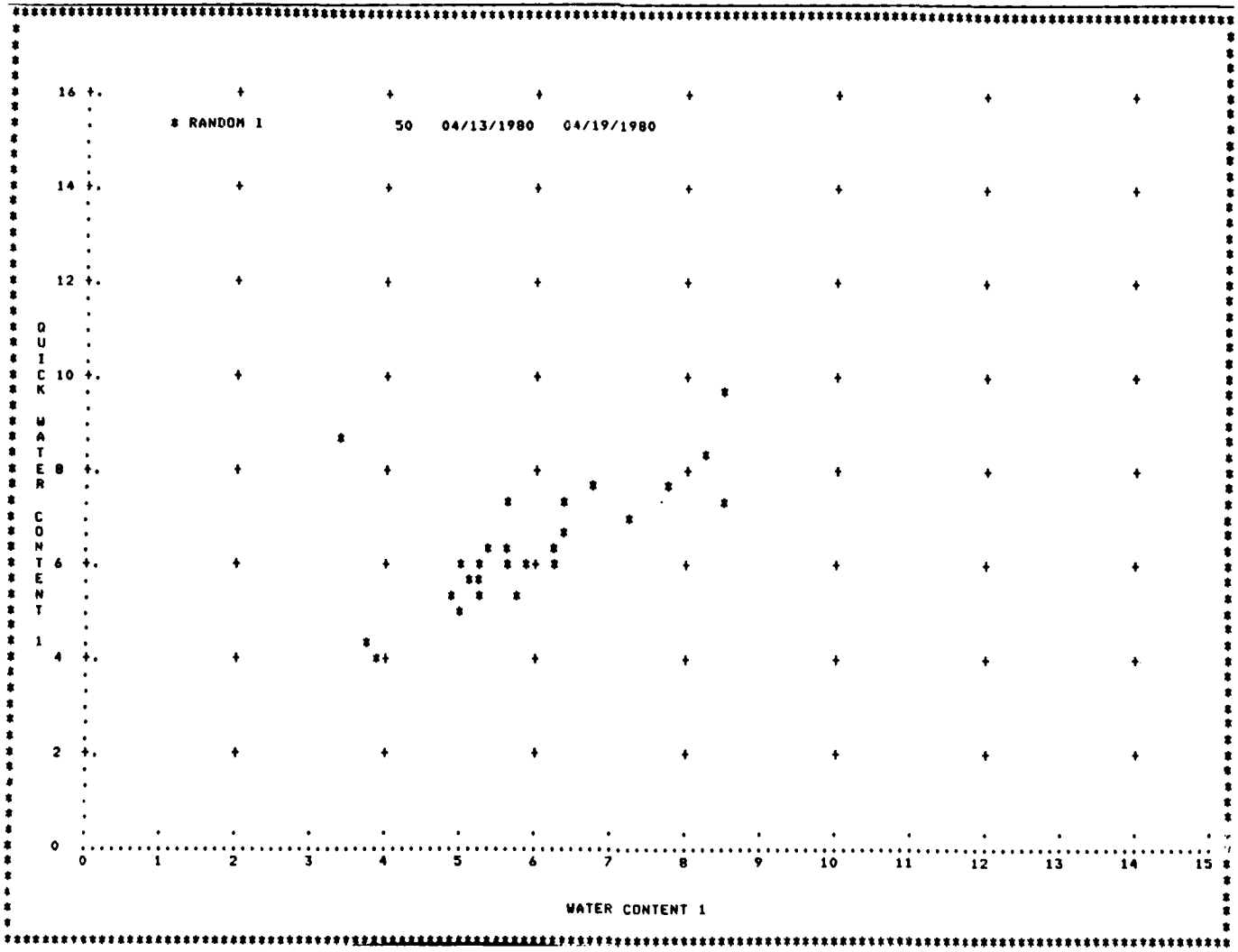
(Continued)

Table 11 (Continued)



(Continued)

Table 11 (Continued)



(Continued)

Table 11 (Continued)

```
 END OF RUN
*
C>OLD,EEE1
C>LIS*
   EMBANK-ZONE     REPORT-NO    BEGIN-DATE      END-DATE
 ***
 * RANDOM I              50    04/13/1980    04/19/1980
         NO      QFWC     FWC      Q1WC       WC1
 ***
 *     11338      6.4      6.3       7.2       5.6
 *     11339      7.8      6.5       6.4       6.2
 *     11342               7.4       9.6       8.5
 *     11343      8.2      6.0       7.6       6.7
 *     11344      8.5      7.5       6.0       6.3
 *     11345      7.2      7.2       6.2       5.6
 *     11351      8.4      7.2       4.4       3.7
 *     11352      6.9      5.9       4.1       3.9
 *     11353     10.6     12.0       8.3       8.3
 *     11341      7.3      6.8       6.0       5.9
 *     11348      8.1      6.1       5.5       5.8
 *     11357      6.9      6.0       5.4       5.2
 *     11358      8.7      6.3       7.4       6.4
 *     11359      6.0      5.7       6.0       5.0
 *     11360      9.4      6.4       6.2       5.4
 *     11361      7.4      5.6       5.7       5.1
 *     11362      8.5      7.0       6.8       6.4
 *     11349      7.7      7.1       5.3       4.9
 *     11350      9.4      7.9       8.6       3.4
 *     11355      8.6      6.7       6.1       5.3
 *     11356      8.8      7.1       7.0       7.2
 *     11363     13.4     10.5                 9.2
 *     11377      7.7      6.9       5.7       5.3
 *     11375      9.6      8.0       4.9       5.0
 *     11365               7.5       6.3       6.3
 *     11366      6.2      6.3       5.9       5.6
 *     11367      8.3      7.1       6.5       6.3
 *     11373     11.3     11.7       7.6       7.8
 *     11374     12.4     12.9       7.4       8.5
C>
```

Listing of data file (separate from program)

(Continued)

Table 11 (Continued)

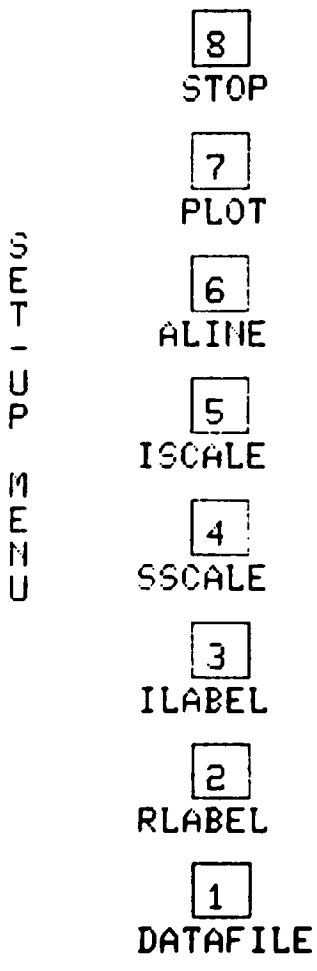
```
IDLE.
C>GET,GENPLOT/UN=CER0K2
C>CALL,GENPLOT
 DEVICE-
I>TK4
```

Generalized X-Y plot

```
 WOULD YOU LIKE TO SELECT SEVERAL OPTIONS AT
 ONE TIME  (Y/N)
I>Y
```

(Continued)

Table 11 (Continued)



MULTIPLE OPTIONS ARE SELECTED
TO EXIT, MOVE THE CROSSHAIRS ABOVE BOX 8
AND ENTER A CARRIAGE RETURN ONLY

Selected options 1,3,4 and 7
to generate a new plot

(Continued)

Table 11 (Continued)

```
 CAT/FILE DESCRIPTION OF INPUT FILE        Option 1, data file
I>PLOT5
     EMBANK-ZONE     REPORT-NO    BEGIN-DATE      END-DATE
   ***

 IS THIS THE BEGINNING OF YOUR DATA (Y/N)
I>N
   * IMP                          4    04/01/1981

 IS THIS THE BEGINNING OF YOUR DATA (Y/N)
I>N
            NO      QFWC     QDOWC       FWC      DOWC
   ***

 IS THIS THE BEGINNING OF YOUR DATA (Y/N)
I>N
   *      1037      22.0      -1.8      22.0      -1.8

 IS THIS THE BEGINNING OF YOUR DATA (Y/N)
I>Y

           1         2         3         4         5
  123456789012345678901234567890123456789012345678901234567890
   *      1037      22.0      -1.8      22.0      -1.8

 INPUT STARTING COLUMN FOR X
I>25

 NUMBER OF CHARACTERS IN X FIELD
I>6
```

(Continued)

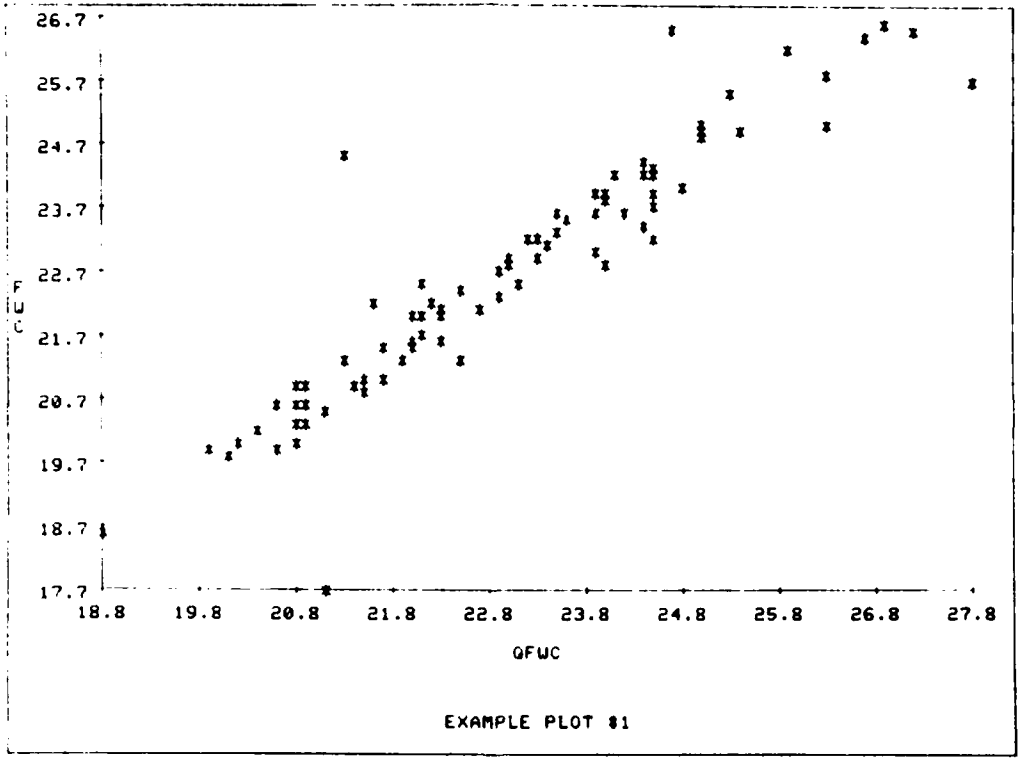
(Sheet 15 of 26)

Table 11 (Continued)

```
 NUMBER OF CURVES PER PLOT                    Option 1 (continued)
I>1
     CURVE 1
 IS THIS DATA IN SAME DATA FILE (Y/N)
I>Y

          1         2         3         4         5
 12345678901234567890123456789012345678901234567890
  *      1037      22.0      -1.8      22.0      -1.8

 INPUT STARTING COLUMN FOR Y
I>34

 NUMBER OF CHARACTERS IN Y FIELD
I>6

 DO YOU WANT A LINE TO CONNECT DATA POINTS (Y/N)
I>N

                                          Option 3, input titles

 INPUT TITLE (23 CHARACTERS MAX)
I>EXAMPLE PLOT #1

 INPUT X-AXIS LABEL (23 CHARACTERS MAX.)
I>QFWC

 INPUT Y-AXIS LABEL (23 CHARACTERS MAX.)
I>FWC
```

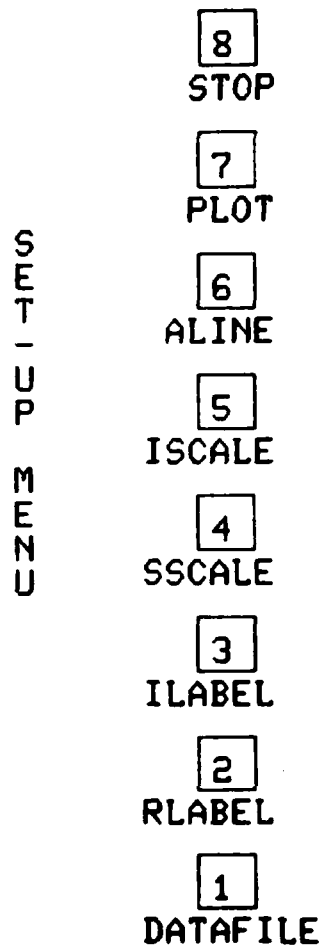
(Continued)

Table 11 (Continued)



(Continued)

Table 11 (Continued)



MULTIPLE OPTIONS ARE SELECTED
TO EXIT, MOVE THE CROSSHAIRS ABOVE BOX 8
AND ENTER A CARRIAGE RETURN ONLY

Selected options 5,6 and 7

Table 11 (Continued)

Option 5, input scale

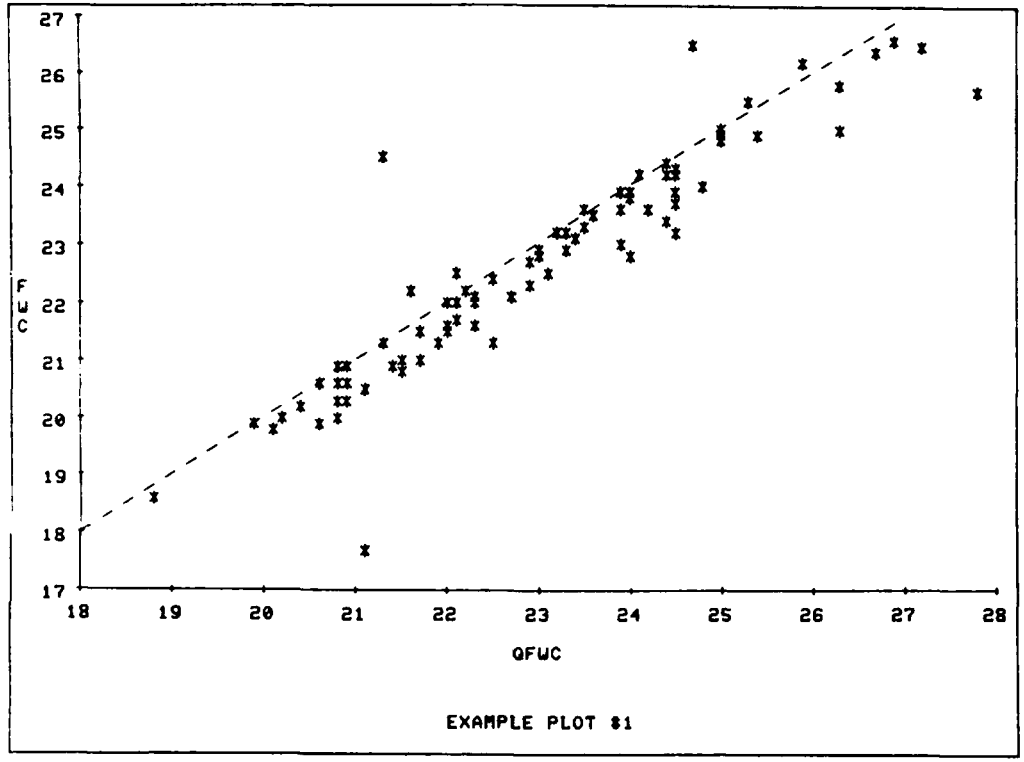
```
  INPUT XMIN,XMAX FOR BOUNDARY
I>18.0,28.0
        % < ERROR, RETYPE RECORD AT THIS FIELD
I>18.0,28.0
  INPUT X INCREMENT
I>1.0
  INPUT YMIN,YMAX FOR BOUNDARY
I>17.0,27.0
  INPUT Y INCREMENT
I>1.0
```

Option 6, add lines to plot

```
  NUMBER OF LINES TO BE ADDED (4 MAX.)
I>1

  INPUT STARTING POINT OF THE LINE (X,Y)
I>17.0,17.0

  INPUT END-OF-LINE POINT (X,Y)
I>28.0,28.0
```

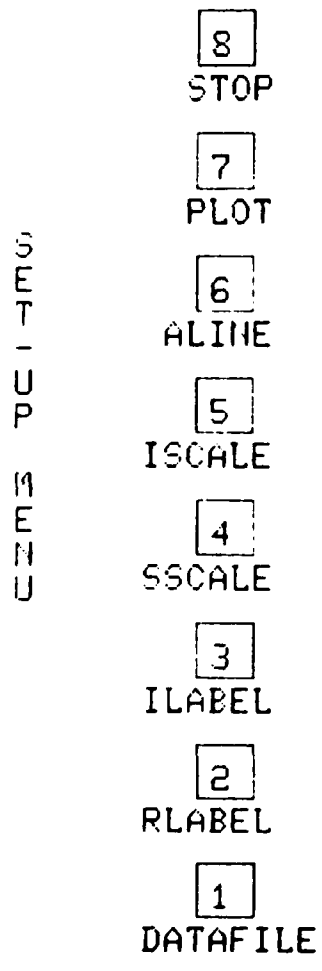
(Continued)

Table 11 (Continued)



(Continued)

Table 11 (Continued)



MULTIPLE OPTIONS ARE SELECTED
TO EXIT, MOVE THE CROSSHAIRS ABOVE BOX 8
AND ENTER A CARRIAGE RETURN ONLY

Selected options 1,3,4, and 7
to generate a new plot

(Continued)

Table 11 (Continued)

```
 CAT/FILE DESCRIPTION OF INPUT FILE   Option 1, data file (Plot #2)
I>PLOT5
     EMBANK-ZONE     REPORT-NO    BEGIN-DATE      END-DATE
   ***

 IS THIS THE BEGINNING OF YOUR DATA (Y/N)
I>N
   * IMP                          4    04/01/1981

 IS THIS THE BEGINNING OF YOUR DATA (Y/N)
I>N
            NO      QFWC     QDOWC       FWC      DOWC
   ***

 IS THIS THE BEGINNING OF YOUR DATA (Y/N)
I>N
   *      1037      22.0      -1.8      22.0      -1.8

 IS THIS THE BEGINNING OF YOUR DATA (Y/N)
I>Y

            1         2         3         4         5
  123456789012345678901234567890123456789012345678901234567890
   *      1037      22.0      -1.8      22.0      -1.8

 INPUT STARTING COLUMN FOR X
I>16

 NUMBER OF CHARACTERS IN X FIELD
I>6
```

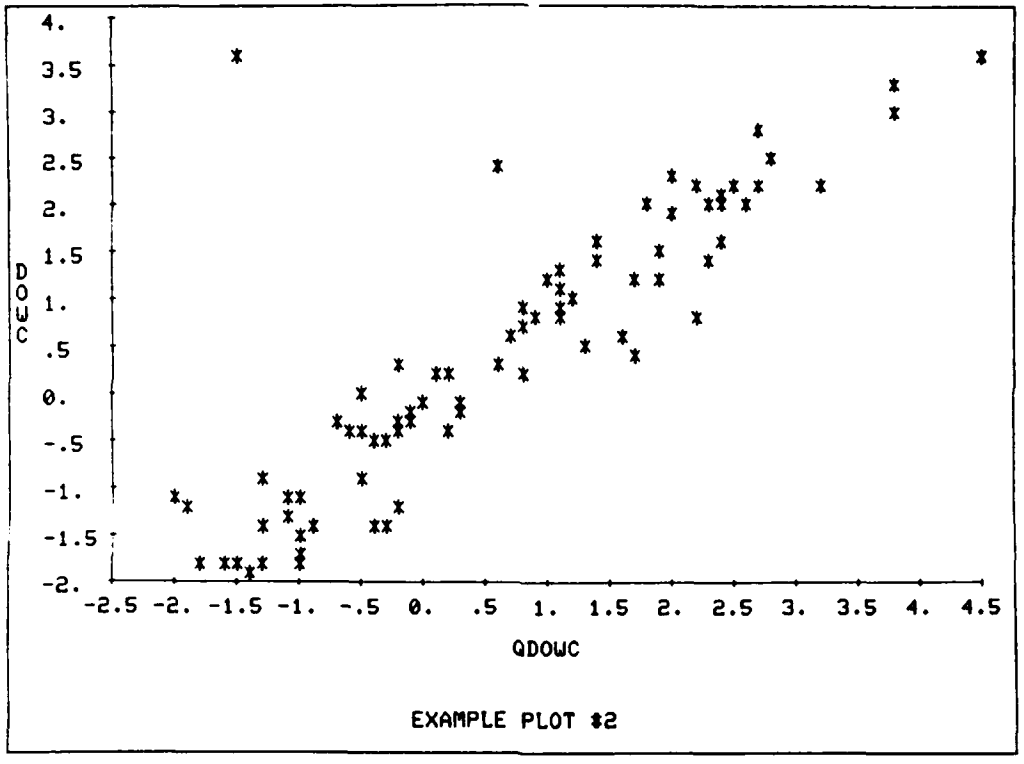
(Continued)

Table 11 (Continued)

```
     CURVE 1
 IS THIS DATA IN SAME DATA FILE (Y/N)
I>Y

          1         2         3         4         5
 123456789012345678901234567890123456789012345678901234567890
  *      1037      22.0      -1.8      22.0      -1.8

 INPUT STARTING COLUMN FOR Y
I>43

 NUMBER OF CHARACTERS IN Y FIELD
I>6
```

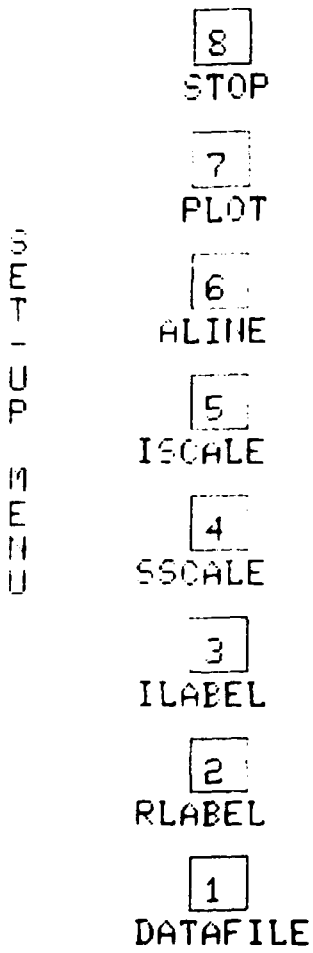
(Continued)

Table 11 (Continued)



(Continued)

Table 11 (Continued)

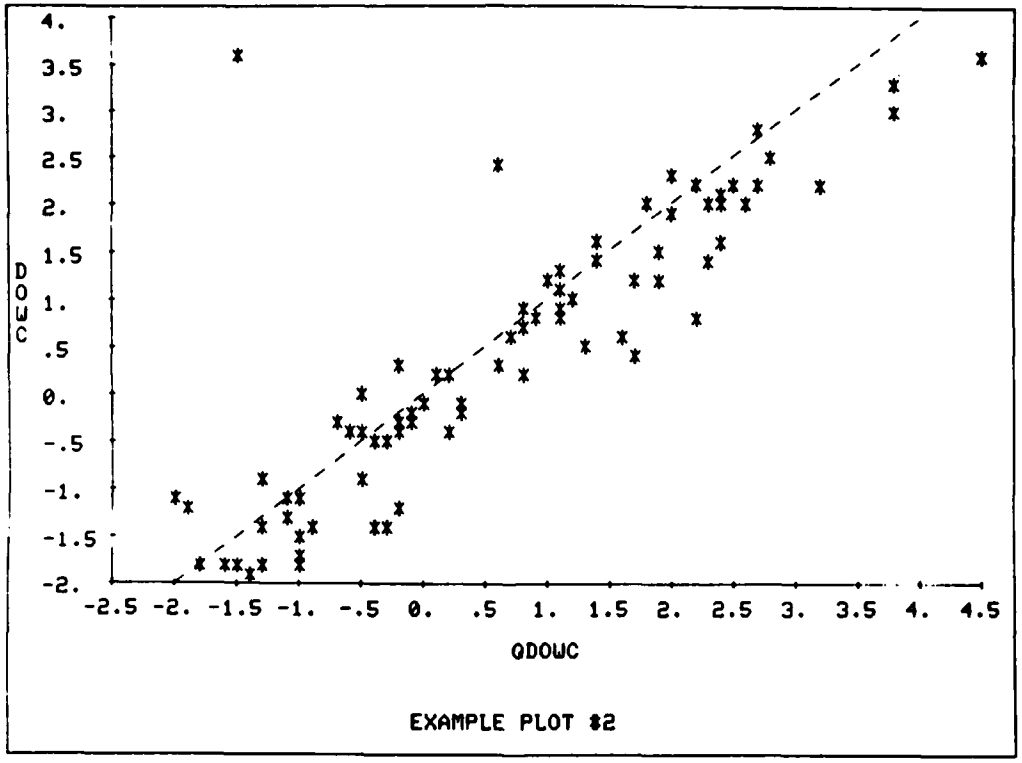


MULTIPLE OPTIONS ARE SELECTED
TO EXIT, MOVE THE CROSSHAIRS ABOVE BOX 8
AND ENTER A CARRIAGE RETURN ONLY

Selected options 6 and 7

(Continued)

Table 11 (Concluded)



REFERENCES

American Society for Testing and Materials. 1981. ASTM Annual Book of Standards, Part 19, "Soil and Rock, Building Stones, and Peat," Philadelphia, Pa.

Hammer, D. P. and Bennett, R. D. 1979. "Results of Geotechnical Computer Usage Survey," Miscellaneous Paper GL-79-19, U. S. Army Engineer Waterways Experiment Station, Vicksburg, Miss.

Intel Systems Corporation. 1981. "System 2000 LSM (Language Specification Manual) for QUEST Language, Release 2.80," Document No. 221126, Austin, Tex.

Intel Systems Corporation. 1983. "System 2000 LSM (Language Specification Manual) for the FORTRAN Programing Language (PLEX) for CDC," Document No. 1022, Austin, Tex.

APPENDIX A: LISTING OF FILE RPTWRT, A SUMMARY OF BASIC REPORT WRITER PROGRAM FILES

***** CORPS OF ENGINEERS *****

**** GEOTECHNICAL CONSTRUCTION CONTROL DATA BASE ****

***** REPORT WRITER PROGRAMS *****

LATEST UPDATE: 9 JAN 81

THE FOLLOWING REPORT WRITER PROGRAMS ARE AVAILABLE FOR USE WITH THE GEOTECHNICAL CONSTRUCTION CONTROL DATA BASE SYSTEM.

	FILE NAME	REPORT NAME	DESCRIPTION
			THE FOLLOWING FILES GENERATE HISTOGRAM TABLES FOR SPECIFIED EMBANKMENT ZONES AND AND REPORT PERIODS. THE TABLES CONTAIN BOTH THE PERCENT AND NUMBER OF TESTS IN EACH INTERVAL.
	DOWCH	OWC	DEVIATION FROM OPTIMUM WATER CONTENT
	PCH	PC	PERCENT COMPACTION
*	FDDH	MOD	FIELD DRY DENSITY
	FWCH	WC	FIELD WATER CONTENT
	GR2H	GR2	PERCENT PASSING #200 SIEVE
	PIH	PI	PLASTIC INDEX
	WEEKS	WEEK	GENERATES BY SPECIFIED EMBANKMENT ZONE AND REPORT PERIOD THE REPORT AND CUMULATIVE AVERAGES (FROM THE BEGINNING OF THE REQUEST) FOR PERCENT COMPACTION, DEV. FROM OPTIMUM, MAX. DRY DENSITY, AND FIELD WATER CONTENT
	GR200	SGR200	GENERATES THE REPORT AND CUMULATIVE AVERAGES (FROM THE BEGINNING OF THE REQUEST) OF THE PERCENT PASSING #200 SIEVE FOR ANY EMBANKMENT ZONE AND REPORT PERIOD.
	MCIC	MCOMPIC	GENERATES THE REPORT AND CUMULATIVE AVERAGES (FROM THE BEGINNING OF THE REQUEST) FOR THE IMPERVIOUS ZONE TESTS THAT HAVE LESS THAN 25% PASSING #200 SIEVE.
	MCRI	MCOMPRI	GENERATES THE REPORT AND CUMULATIVE AVERAGES (FROM THE BEGINNING OF THE

* *Shown in Figure A1 as an example on how to execute a report writer program.*

		REQUEST) FOR THE RANDOM I ZONE TESTS THAT HAVE MORE THAN 50% PASSING #200 SIEVE.
SUMDAY	SUMDAY	GENERATES A SUMMARY OF THE SPECIFIED TESTS.
SUMLARD	SUMLARD	GENERATES A TABLE SHOWING WHICH LAB (QC OR QA) DID THE SOIL TESTING FOR EACH REQUESTED DATE
SUMLABW	SUMLABW	GENERATES A TABLE SHOWING WHICH LAB(QC OR QA) DID THE SOIL TESTING FOR EACH REQESTED REPORT PERIOD.
SUM200	SUM200	LISTS THE 5-PT DATA ORDERED BY, LOW TO HIGH ACCORDING TO THE #200, #100, #40, AND #16 GRADATIONS,
SUM5PT	SUM5PT	LISTS THE 5-PT DATA IN NUMERICAL SEQUENCE OF THE CURVE NUMBER.

TO USE THESE REPORT WRITER PROGRAMS THE FOLLOWING COMMANDS ARE USED BEFORE ENTERING THE DATA BASE.

C GET,XXXXXXX/UN=CER0K2

WHERE THE 'X'S REPRESENT THE FILE NAME OF THE REPORT.
NOTE-1) THE 'C' AND 'I' ARE COMPUTER PROMPTS.
2) THE '/UN=CER0K2' IS NOT NECESSARY IF THE FILE RESIDES IN THE LOCAL USERID.

ONCE THE USER IS USING THE DATA BASE,THE REPORT WRITER IS EXCUTED WITH THE FOLLOWING COMMAND.

I COMMAND FILE IS XXXXXXX;

WHERE THE 'X'S REPRESENT THE FILE NAME OF THE REPORT.
THE COMPUTER WILL STATE THAT NO ERRORS HAVE OCCURED. IF THERE IS A GENERATE STATEMENT IN THE FILE,THE SELECTED REPEATING GROUP WILL BE IDENTIFIED. IF THIS DOES NOT OCCUR THE FOLLOWING STATEMENT IS NEEDED.

I GENERATE YYYYYY WHERE USE FAILS (AND ANY OTHER WHERE CLAUSE);

WHERE THE 'Y'S REPRESENT THE REPORT NAME.
NOTE-ANY ACCEPTABLE WHERE CLAUSE MAY BE USED.

IF THE USER WANTS THE REPORT SAVED ON AN OUTPUT FILE,THE FOLLOWING COMMAND IS USED BEFORE THE COMMAND FILE STATEMENT.

I REPORT FILE IS ZZZZZZ;

WHERE THE 'Z'S REPRESENT THE OUTPUT FILE NAME.
NOTE-AFTER THE USER IS OUT OF THE DATA BASE,THESE FILES NEED TO BE SAVED. ALL THAT IS NEEDED IS TO SAY 'SAVE,ZZZZZZ'.

EXAMPLE:

THE FOLLOWING EXAMPLE ILLUSTRATES THE DESCRIBED PROCEDURE.

C GET,FDDH/UN=CER0K2 (BEFORE USING THE DATA BASE)

I REPORT FILE IS HIT1; (AFTER THE USER IS IN THE DATA BASE)

I COMMAND FILE IS FDDH;

COMPUTER WILL RESPOND WITH 'NO ERRORS HAVE OCCURED'

I GENERATE MDD WHERE USE FAILS;(IF THERE IS NOT A GENERATE STATEMENT IN THE REPORT FILE)

COMPUTER WILL RESPOND WITH '-SELECTED RG IS 60' (NOTE IF THE GENERATE STATEMENT IS IN THE REPORT FILE,THAT STATEMENT WILL BE PRINTED WHEN THE REPORT IS COMPLETE.

C SAVE,HIT1 (AFTER THE USER IS OUT OF THE DATA BASE)

C)

```
                                                                C>
IDLE.
C)GET,S2KGET/UN=CECE2K
C)GET,FDDH/UN=CER0K2
C)CALL,S2KGET
 09.22.36.  S2KGET(CORPS)
1
C)S2K
 82/08/18. 09.22.39. BEGIN SYSTEM 2000  VERSION 2.60F
 ---
I)USER,DLW;SHARED DBN IS INTDB:
 -556-   ASSIGNED   SAVDB                    1   104 82/08/16. 11.32.54.
 ---
I)REPORT FILE IS EX1;
 ---
I)COMMAND FILE IS FDDH;
      NO ERRORS HAVE OCCURRED
 ---
I)GENERATE MDD WHERE USE FAILS;
 - SELECTED RG IS 60
 ---
I)EXIT;
 -506-   CLOSED     SAVDB                    1   104 82/08/16. 11.32.54.
 82/08/18. 09.23.58. END   SYSTEM 2000  VERSION 2.60F
STOP S2K
C)SAVE,EX1
C)
 ILLEGAL CONTROL CARD.
C)OLD,EX1
C)LIST
1
```

REPORT-HISTOGRAM TABLE FOR FIELD DRY DENSITY
DATE OF REPORT 08/18/82

NOTE-BOTH PERCENTAGES AND NUMBER OF TESTS
ARE PRESENTED FOR EACH INTERVAL

EMBANKMENT ZONE	<110	[110,115)	[115,120)	[120,125)	[125,130)	[130,135)	[135,140)	GE140	AVG\TOTAL TESTS	
IMP	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	98.5	403.
	403.	0.	0.	0.	0.	0.	0.	0.		
IMP WET	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	97.5	178.
	178.	0.	0.	0.	0.	0.	0.	0.		
IWR	0.0	0.0	11.9	36.9	32.1	15.5	3.6	0.0	125.5	84.
	0.	0.	10.	31.	27.	13.	3.	0.		
MASS SAND	75.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	109.7	4.
	3.	1.	0.	0.	0.	0.	0.	0.		
SAND FILTER	63.8	33.2	3.0	0.0	0.0	0.0	0.0	0.0	108.8	431.
	275.	143.	13.	0.	0.	0.	0.	0.		
SD IWR	1.8	21.8	36.4	27.3	9.1	3.6	0.0	0.0	119.2	55.
	1.	12.	20.	15.	5.	2.	0.	0.		
-3 FIRM	0.0	0.0	0.0	0.0	33.3	50.0	16.7	0.0	131.5	6.
	0.	0.	0.	0.	2.	3.	1.	0.		

1
1

Figure A1. Example of table from report writer file FDDH

APPENDIX B: ADDITIONAL REPORT WRITER PROGRAM FILES NOT INCLUDED IN RPTWRT

```
GET,S2KGET/UN=OECE2K
C)GET,SFDDH/UN=CER0U4
C)CALL,S2KGET
 09.16.17.  S2KGET(CORPS)
2
C)S2K
 82/08/18. 09.16.21. BEGIN SYSTEM 2000  VERSION 2.60F
 ---
I)USER,DLW;SHARED DBN IS INTDB;
 -556-   ASSIGNED   SAVDB                    1   104 82/08/16. 11.32.54.
 ---
I)REPORT FILE IS EX2;
 ---
I)COMMAND FILE IS SFDDH;
      NO ERRORS HAVE OCCURRED
 ---
I)GENERATE MDD WHERE BSE FAILS;
 - SELECTED RG IS 60
 ---
I)EXIT;
 -506-   CLOSED     SAVDB                    1   104 82/08/16. 11.32.54.
 82/08/18. 09.19.38. END   SYSTEM 2000  VERSION 2.60F
STOP S2K
C)SAVE,EX2
C)

C)OLD,EX2
C)LIST
1
```

B2

REPORT-HISTOGRAM TABLE FOR FIELD DRY DENSITY
DATE OF REPORT 08/18/82

NOTE-BOTH PERCENTAGES AND NUMBER OF TESTS
ARE PRESENTED FOR EACH INTERVAL

EMBANKMENT ZONE	<80	[80,85)	[85,90)	[90,95)	[95,100)	[100,105)	[105,110)	GE110	AVG	TOTAL TESTS
IMP	0.0 0.	0.2 1.	1.0 4.	18.6 75.	42.7 172.	33.7 136.	3.7 15.	0.0 0.	98.5	403.
IMP WET	0.0 0.	0.0 0.	1.1 2.	21.9 38.	57.3 102.	17.4 31.	2.2 4.	0.0 0.	97.5	178.
IWR	0.0 0.	0.0 0.	0.0 0.	0.0 0.	0.0 0.	0.0 0.	0.0 0.	100.0 84.	125.5	84.
MASS SAND	0.0 0.	0.0 0.	0.0 0.	0.0 0.	0.0 0.	0.0 0.	75.0 3.	25.0 1.	109.7	4.
SAND FILTER	0.0 0.	0.0 0.	0.0 0.	0.0 0.	0.0 0.	9.0 39.	54.8 236.	36.2 156.	108.8	431.
SD IWR	0.0 0.	0.0 0.	0.0 0.	0.0 0.	0.0 0.	0.0 0.	1.8 1.	98.2 54.	119.2	55.
-3 FINN	0.0 0.	0.0 0.	0.0 0.	0.0 0.	0.0 0.	0.0 0.	0.0 0.	100.0 6.	131.5	6.

```
1
1
C)
```

Figure B1. Example of table from report writer file SFDDH

```
GET,S2KGET/UN=CECE2K
C>GET,WFWCH/UN=CER0W4
C>CALL,S2KGET
 09.31.33.  S2KGET(CORPS)
*
C>S2K
 82/08/24. 09.31.39. BEGIN SYSTEM 2000  VERSION 2.60F
 ---
I>USER,DLW;SHARED DBN IS INTDB;
 -556-   ASSIGNED   SAVDB                    1   128 82/08/23. 10.19.06.
 ---
I>REPORT FILE IS EX3;
 ---
I>COMMAND FILE IS WFWCH;
      NO ERRORS HAVE OCCURRED
 ---
I>GENERATE WC WM C21 EQ IMP AND USE FAILS;
 - SELECTED RG IS 60
 ---
I>EXIT;
 -506-   CLOSED     SAVDB                    1   128 82/08/23. 10.19.06.
 82/08/24. 09.33.18. END   SYSTEM 2000  VERSION 2.60F
STOP S2K
C>SAVE,EX3
C>OLD,EX3
C>LIST
1
```

REPORT-HISTOGRAM TABLE FOR FIELD WATER CONTENT
DATE OF REPORT 08/24/82

NOTE-BOTH PERCENTAGES AND NUMBER OF TESTS
ARE PRESENTED FOR EACH INTERVAL

EMBANKMENT ZONE	<16	[16,18)	[18,20)	[20,22)	[22,24)	[24,26)	[26,28)	[28,30)	GE30	AVG\TOTAL TESTS
IMP	0.0	0.7	8.1	24.7	36.9	20.5	7.8	1.0	0.2	22.9
	0.	3.	33.	101.	151.	84.	32.	4.	1.	409.

```
1
1
C>
```

Figure B2. Example of table from report writer file WFWCH

```
COMMAND FILE IS SUMRIC;
      NO ERRORS HAVE OCCURRED
 ---
I>GENERATE SUMREPT WH C21 EQ I.C.MAIN DAM AND C55 EQ 35;
 - SELECTED RG IS 60
1
1
1
```

WARM SPRINGS DAM AND LAKE SONOMA

SUMMARY RANKING OF FIELD COMPACTION TESTING
OCT/12/1982

I.C.MAIN DAM
REPORT NO. 35
JUL/20/1980 THRU JUL/26/1980

RPT NO.	CNT	AVG CMP	<90	>90 <93	>93	<87	>87 <88	>88 <89	>89 <90	>90 <91	>91 <92	>92 <93	>93 <94	>94 <95	>95 <96	>96 <97	>97 <98	>98 <99	>99 <100	>10 <10
35	30	97.6	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	3.3	20.0	10.0	16.7	13.3	13.3	10.

SUMMARY RANKING OF FIELD MOISTURE TESTING
OCT/12/1982

I.C.MAIN DAM
REPORT NO. 35
JUL/20/1980 THRU JUL/26/1980

RPT NO.	CNT	AVG DEV	<2	>2 <5	>5	<0	>0 <1	>1 <2	>2 <3	>3 <4	>4 <5	>5 <6	>6 <7	>7 <8	>8 <9	>9 <10	>10
35	30	+ 1.4	63.3	36.7	0.0	10.0	20.0	33.3	36.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

FOUNDATION AND MATERIALS SOIL TESTING
OCT/12/1982

I.C.MAIN DAM
REPORT NO. 35
JUL/20/1980 THRU JUL/26/1980

--ALL F&M TESTING-- TESTS	5 PT	1 PT	-------QC LAB------- TESTS	5 PT	1 PT	-------QA LAB------- TESTS	5 PT	1 PT
36	6	30	34	4	30	2	2	0

Figure B3. Example of table from report writer file SUMRIC

```
COMMAND FILE IS SUMRRI;
      NO ERRORS HAVE OCCURRED
 ---
1>GENERATE SUMREPT WH C21 EQ RANDOM I AND C55 EQ 110;
 - SELECTED RG IS 60
1
1
1
```

WARM SPRINGS DAM AND LAKE SONOMA

SUMMARY RANKING OF FIELD COMPACTION TESTING
OCT/12/1982

RANDOM I
REPORT NO.110
OCT/18/1981 THRU OCT/24/1981

RPT NO.	CNT	AVG CMP	<92 <95	>92	>95	<90	>90 <91	>91 <92	>92 <93	>93 <94	>94 <95	>95 <96	>96 <97	>97 <98	>98 <99	>99 <100	>100 <101	>101 <102	>102 <103	>103 <104
110	46	99.4	0.0	6.5	93.5	0.0	0.0	0.0	0.0	2.2	4.3	6.5	8.7	8.7	13.0	13.0	13.0	10.9	10.9	4.3

SUMMARY RANKING OF FIELD MOISTURE TESTING
OCT/12/1982

RANDOM I
REPORT NO.110
OCT/18/1981 THRU OCT/24/1981

RPT NO.	CNT	AVG DEV	<0	>0 <3	>3	<-3	>-3 <-2	>-2 <-1	>-1 <0	>0 <1	>1 <2	>2 <3	>3 <4	>4 <5	>5 <6	>6 <7	>7
110	46	- 0.4	80.4	19.6	0.0	0.0	0.0	15.2	65.2	15.2	4.3	0.0	0.0	0.0	0.0	0.0	0.0

FOUNDATION AND MATERIALS SOIL TESTING
OCT/12/1982

RANDOM I
REPORT NO.110
OCT/18/1981 THRU OCT/24/1981

--ALL F&M TESTING-- TESTS	5 PT	1 PT	-------QC LAB------- TESTS	5 PT	1 PT	-------QA LAB------- TESTS	5 PT	1 PT
48	7	41	47	6	41	1	1	0

Figure B4. Example of table from report writer file SUMRRI

Table B1

Description of Additional Report Writer Files

Report Writer File Name	Description
SUM5200	Summary of 5-point compaction test with the results ordered by 'Material Source,' GR200, GR100, GR40, and GR16. A record is selected if GR200 exists. File SUM200 is the same except the record is selected if CNO exists.
SUM5MCL	Summary of embankment testing showing location and results. A record is selected if USE exists.
SUM5MCI	Summary of instrument pad testing showing location and results. A record is selected if PAD exists.
SUM5BOR	Summary of five-point compaction tests ordered by borrow source, maximum dry density and optimum water content. A record is selected if CNO exists.
SUMTOTX	Summary of embankment testing, similar to SUMSUM which is in the User's Manual. A record is selected if NO exists.
SUMTOT	Summary of embankment testing. A record is selected if USE fails.
SUMRMST	Summary ranking of field moisture content grouped by 'Material Source' with a total ranking for all sources.
SUMODEV	Summary ranking of field moisture testing using only original embankment tests (excluding retest, voids, instr. pads) by report period.
SUMRDEN	Summary ranking of field dry density is like 'SUMRMST' but for dry density.
SUMOCMP	Summary ranking of field compaction testing is like SUMODEV but for field compaction tests.
SUMFMST	Summary ranking of field moisture content ordered by 'Material Source' with rankings grouped by 'Material Source' with totals for each 'Embankment Zone.' A record is selected if USE fails.
SUMFDEN	Summary ranking of field dry density ordered by 'Material Source' with rankings grouped by 'Material Source' with totals for each 'Embankment Zone.' A record is selected if USE fails.

(Continued)

Table B1 (Concluded)

Report Writer File Name	Description
SUMDEVR	Summary ranking of deviation from optimum water content which is similar to SUMDEV (which selects records if USE fails). A record is selected if REC fails.
SUMCMPR	Summary ranking of percent compaction, similar to SUMCMP with a record selected if REC fails.
SUMBDEV	Summary ranking of deviation from optimum water content ordered by 'Material Source' with rankings grouped by 'Material Source' and totals for each 'Embankment Zone.' A record is selected if USE fails.
SUMBCMP	Summary ranking of field compaction testing ordered by 'Material Source' with rankings grouped by 'Material Source' and totals for each 'Embankment Zone.' A record is selected if USE fails.
SUMATTR	Summary of plasticity testing ordered by 'Material Source,' 'Liquid Limit,' and 'Plastic Index.' This file lists 'Material Source,' LL, PI, and number of particular PI that exists. A record is selected if PI exists.

APPENDIX C: GRAPHIC PROGRAM INSTRUCTION FILE, GEOPLT

```
OLD,GEOPLT
C>LIST
```

****** CORPS OF ENGINEERS ******

****** GEOTECHNICAL CONSTRUCTION CONTROL DATA BASE ******

****** GRAPHICS PROGRAMS ******

12 AUG 82

QUICK-FINAL WATER CONTENTS PLOT PROCEDURE

THIS PROGRAM WAS DEVELOPED FOR A 132-CHARACTER LINE PRINTER, THEREFORE THE QUALITY OF THE PLOTS ON ANY OTHER DEVICE IS UNCERTAIN AT THIS TIME.

A. BEFORE THIS GRAPHIC PROGRAM CAN BE USED,A REPORT FILE MUST BE GENERATED FROM THE DATA BASE. THIS FILE CONTAINS ONE LINE (70 CHARACTERS) OF TITLE INFORMATION (I.E.EMBANKMENT ZONE,REPORT NUMBER, BEGINNING DATE,ENDING DATE) AND THE INFORMATION FROM THE FOLLOWING COMMAND THAT IS ISSUED WHILE THE USER IS DOING AD HOC RETRIEVALS IN THE DATA BASE.

1. REPORT FILE IS (FILENAME);

2. LIST C21,C55,C41,C43 WHERE C21 EQ (EMBANKMENT ZONE) AND C55 EQ (REPORT NUMBER); (TITLE INFORMATION)

3. LIST NO,QFWC,FWC,Q1WC,WC1 WHERE C21 EQ (EMBANKMENT ZONE) AND C55 EQ (REPORT NUMBER);

4. EXIT; (EXIT FROM DATA BASE)

NOTE: THE DATA COULD BE GROUPED BY REPORT NUMBER,DATE,BORROW SOURCE, LOCATION,OR ANY OTHER VARIABLE THAT DEFINES A DATA GROUP.

THE DATA BASE COMPONENTS (NUMBERS AND ABBR.) HAVE THE FOLLOWING MEANING:

- C21 - EMBANKMENT ZONE
- C55 - REPORT NUMBER
- C41 - BEGINNING DATE OF REPORT NUMBER
- C43 - ENDING DATE OF REPORT NUMBER
- NO - TEST NUMBER
- QFWC - QUICK FIELD WATER CONTENT
- FWC - STANDARD FIELD WATER CONTENT
- Q1WC - QUICK ONE-POINT WATER CONTENT
- WC1 - STANDARD ONE-POINT WATER CONTENT

B. SET THE FORM-FEED TO TOP OF SHEET,HOLD 'CTRL' KEY,PRESS'L'. TURN PAPER ADVANCE KOLB TO FIRST LINE OF NEW SHEET. THIS NEEDS TO BE DONE ONLY ONCE AT THE BEGINNING OF A SESSION.

C. TO EXCUTE THIS GRAPHIC PROGRAM THE FOLLOWING COMMANDS ARE NEEDED:

```
GET,QFW/UN=CER0K2
```

CALL,QFW

THIS SETS THE PLOT PROCEDURE IN MOTION. TWO RESPONCES ARE REQUIRED IN ANSWER TO THE FOLLOWING QUESTIONS:

1. DEVICE -(ENTER:PTR)

2. NAME OF DATA FILE (ENTER REPORT FILE NAME)

HISTOGRAM PLOT PROCEDURE

THIS PACKAGE WAS DEVELOPED FOR A 132-CHARACTER LINE PRINTER, THEREFORE THE QUALITY OF THE PLOTS ON ANY OTHER DEVICE IS UNCERTAIN AT THIS TIME.

A. BEFORE THIS GRAPHIC PACKAGE CAN BE USED,A REPORT FILE MUST BE GENERATED FROM THE DATA BASE. THIS FILE MUST CONTAIN THE OUTPUT FROM ONE OF THE FOLLOWING REPORT WRITER PROGRAMS:

DOWCH
PCH
FDDH
FWCH
GR2H
PIH

SEE FILE 'RPTWRT'(UN=CER0K2) FOR INSTRUCTIONS ON THE EXCUTION OF THE REPORT WRITER PROGRAMS.

B. SET THE FORM-FEED AS DESCRIBED ABOVE.

C. TO EXCUTE THE GRAPHIC PROGRAM,THE FOLLOWING COMMANDS ARE NEEDED:

GET,HG/UN=CER0K2

CALL,HG

THIS SETS THE PLOT PROCEDURE IN MOTION. TWO RESPONCES ARE REQUIRED IN ANSWER TO THE FOLLOWING QUESTIONS:

1. DEVICE - (ENTER:PTR)

2. NAME OF DATA FILE (ENTER REPORT FILE NAME)

SHOTGUN PLOT PROCEDURE

THIS PROGRAM WAS DEVELOPED FOR A 132-CHARACTER LINE PRINTER, THEREFORE THE QUALITY OF THE PLOT ON ANY OTHER DEVICE IS UNCERTAIN AT THIS TIME.

A. BEFORE THIS GRAPHIC PROGRAM CAN BE USED,A REPORT FILE MUST

BE GENERATED FROM THE DATA BASE. THIS FILE MUST CONTAIN THE INFORMATION FROM THE FOLLOWING COMMANDS THAT ARE ISSUED WHILE THE USER IS DOING AD HOC RETRIEVALS IN THE DATA BASE:

1. REPORT FILE IS (FILE NAME);

2. LIST C1,C21 WHERE C21 EQ (EMBANKMENT ZONE);

3. LIST C23,C27,C29 WHERE C21 EQ (EMBANKMENT ZONE);

4. LIST C55,C41,C43 WHERE C21 EQ (EMBANKMENT ZONE) AND C55 EQ (REPORT NUMBER);

5. LIST C61,C63,C113,C111,C149 WHERE C21 EQ (EMBANKMENT ZONE) AND C55 EQ (REPORT NUMBER);

6. EXIT; (EXIT FROM DATA BASE)

NOTE: THE DATA COULD BE GROUPED BY REPORT NUMBER,DATE,BORROW SOURCE, LOCATION,OR ANY OTHER VARIABLE THAT DEFINES A DATA GROUP.

THE DATA BASE COMPONENT NUMBERS HAVE THE FOLLOWING MEANINGS:

C1 - PROJECT NAME
C21 - EMBANKMENT ZONE
C23 - COMP-PERCENT
C27 - WATER CONTENT LIMIT(LOWER)
C29 - WATER CONTENT LIMIT(UPPER)
C55 - REPORT NUMBER
C41 - BEGINNING DATE OF REPORT NUMBER
C43 - ENDING DATE OF REPORT NUMBER
C61 - TEST NUMBER
C63 - INDICATOR OF THE DESPOSITION OF THE TEST
C113 - PERCENT COMPACTION
C111 - DEVIATION FROM THE OPTIUM WATER CONTENT
C149 - COMMENTS ABOUT THE TEST

B. SET THE FORM-FEED AS DESCRIBED ABOVE.

C. TO EXCUTE THE GRAPHIC PROGRAM THE FOLLOWING COMMANDS ARE NEEDED:

GET,SG/UN=CER0K2

CALL,SG

THIS SETS THE PLOT PROCEDURE IN MOTION. TWO RESPONCES ARE REQUIRED IN ANSWER TO THE FOLLOWING QUESTIONS:

1. DEVICE - (ENTER:PTR)

2. NAME OF DATA FILE (ENTER REPORT FILE NAME)

APPENDIX D: QUICK REFERENCE FOR CMEDIT

"CMEDIT" TEXT EDITOR QUIK REFERENCE GUIDE

COMMAND FORMAT:

COMMAND (SHORTHAND) : DESCRIPTION.

(SPACES ARE SIGNIFICANT)
(WHERE NUMBER IS SHOWN, ANY NUMBER IS OK. IF "1" OR "2", IT NEED NOT BE TYPED.)

```
CMEDIT    (CME)  :  INVOKES "CMEDIT", E> IS DISPLAYED.

QUIT       :  TO QUIT WITHOUT USING ANY CHANGES.
SAVE,0     :  TO SAVE ALL CHANGES THUS FAR, WITHOUT LEAVING EDITOR.
              I> IS DISPLAYED FOR AN INSERT.  RETURN CANCELS THE
              INSERT MODE AND RESTORES E>.
FILE,0     :  TO SAVE ALL CHANGES AND TERMINATE "CMEDIT"

TOP      (T)    :  GO TO TOP OF FILE.
BOTTOM   (B)    :  GO TO BOTTOM OF FILE.
UP 5     (U 5)  :  GO UP 5 LINES.
DOWN 5   (D 5)  :  GO DOWN 5 LINES.
LINENO          :  WHAT LINE IS THIS? (CURRENT LINE)
GO 5     (G 5)  :  GO TO 5-TH LINE.
PRINT    (P)    :  PRINT CURRENT LINE
PRINT 5  (P 5)  :  PRINT CURRENT LINE PLUS NEXT FOUR LINES.

INSERT NEW LINE  (I NEW LINE) :  INSERT LINE CONTAINING "NEW
                                 LINE" AFTER CURRENT LINE.
                                 NEW LINE THEN BECOMES CURRENT
                                 LINE.
INSERT           (INS)        :  INSERT BLANK LINE.
DELETE           (DE)         :  DELETE CURRENT LINE.  NEXT LINE
                                 BECOMES CURRENT LINE.
REPLACE NEW LINE (R NEW LINE) :  REPLACE CURRENT LINE WITH "NEW
                                 LINE".  EQUIVALENT OF "DELETE",
                                 "UP", AND "INSERT NEW LINE".

LOCATE /STRING/   (L /STRING/)     :  GO TO NEXT LINE CONTAINING
                                      "STRING".
LOCATE            (L)              :  REPEAT PREVIOUS "LOCATE"
                                      COMMAND.

DITTO 5           (DI 5)           :  REPEAT ANY PREVIOUS COMMAND
                                      5 TIMES.

CHANGE /STRING1/STRING2/
          (C /STRING1/STRING2/) :  CHANGE FIRST OCCURRENCE OF
                                   "STRING1" TO "STRING2" ON
                                   CURRENT LINE.
CHANGE            (C)            :  REPEAT PREVIOUS "CHANGE"
                                    COMMAND.
CHANGE /STRING1/STRING2/ * *     :  CHANGE "STRING1" TO "STRING2"
                                    FOR ALL OCCURRENCES ON ALL
                                    LINES.
LINEND          (LI)       :  USE BEFORE ENTERING ";" CHARACTER, TO
                              CLEAR SPECIAL "CMEDIT" INTERPRETATION
                              OF ";".
START           (ST)       :  DEFINE START OF BLOCK FOR LATER COMMAND.
END                        :  DEFINE END OF BLOCK FOR LATER COMMAND.
REMOVE                     :  DELETES DEFINED BLOCK.
MOVE                       :  INSERTS DEFINED BLOCK AFTER CURRENT LINE.
```

FOR FURTHER "CMEDIT" DOCUMENTATION, GET THE BOEING COMPUTER SERVICES (BCS) MANUAL 10208-005, "INTERACTIVE TIMESHARING (KIT) USERS MANUAL.

APPENDIX E: INSTRUCTIONS FOR BACKUP COPY OF DATA BASE

INSTRUCTIONS FOR BACKUP OF DATA BASE IN CASE OF DAMAGE
DURING ADDING OR MODIFYING DATA

```
C> -S2000, SR
SAVE OR RESTORED?
I>  SAVE
NAME OF THE DATA BASE TO BE SAVED/RESTORED?
I>  "DATA BASE NAME"
NAME OF FILE THAT DATA BASE IS SAVED/
RESTORED ON?  (DEFAULT IS TAPE999)
I>  "SAVE FILE NAME"
83/03/22.  11.54.14.  BEGIN SYSTEM 2000 VERSION 2-6ØF
I  USER, ...
```

NOTE: ONCE THE SAVE FILE IS NO LONGER NEEDED, YOU MUST PURGE IT TO AVOID UNNECESSARY STORAGE COST.

In accordance with letter from DAEN-RDC, DAEN-ASI dated 22 July 1977, Subject: Facsimile Catalog Cards for Laboratory Technical Publications, a facsimile catalog card in Library of Congress MARC format is reproduced below.

Edris, Earl V.
Geotechnical construction control data base system: user's manual / by Earl V. Edris, Jr., David P. Hammer, Wipawi Vanadit-Ellis (Geotechnical Laboratory, U.S. Army Engineer Waterways Experiment Station). -- Vicksburg, Miss. : The Station ; Springfield, Va. ; available from NTIS, 1983.
185 p. in various pagings : ill. ; 27 cm. -- (Instruction report ; GL-83-1)
Cover title.
"April 1983."
Final report.
"Prepared for Office, Chief of Engineers, U.S. Army."
"A report under the Computer Applications in Geotechnical Engineering (CAGE) Project."
Bibliography: p. 165.

Edris, Earl V.
Geotechnical construction control data base : ... 1983.
(Card 2)

1. Earth dams. 2. Electronic data processing. 3. Engineering. I. Hammer, David P. II. Vanadit-Ellis, Wipawi. III. United States. Army. Corps of Engineers. Office of the Chief of Engineers. IV. U.S. Army Engineer Waterways Experiment Station. Geotechnical Laboratory. V. Title VI. Series: Instruction report (U.S. Army Engineer Waterways Experiment Station) ; GL-83-1.
TA7.W34i no.GL-83-1